- An adjustment "K" factor of -2.0 dB has been applied to the residences that have similar acoustical and geometrical characteristics to measurement site ST2A. According to simultaneous measurements at sites ST2A and LT2, there should be a difference of 2 dB between these two receivers in the noise model. The adjustment factor is needed to account for the elements that effect sound propagation that are not accounted for in the noise model due to double/parallel soundwalls in front of the measurement site and neighboring receivers. This adjustment factor was applied to Receivers R1.41 through R1.46.
- A calibration or "K" factor of +1.8 dB has been applied to the residences that have similar acoustical and geometrical characteristics to Calibration Site 31 (measurement site LT22). This calibration factor is needed to account for the elements that effect sound propagation that is not accounted for in the noise model. This adjustment factor was applied to Receivers R5.11 through R5.38.
- An adjustment "K" factor of -1.0 dB has been applied to receivers that have similar acoustical and geometrical characteristics to measurement site ST42. The adjustment factor is needed to account for the mesh tarps that cover fences around the tennis courts represented by Receivers R5.39 and R5.40.

## Table 6-3. Noise Model Calibration Results

| Calibration Site | Measurement Site | Modeled Rec. No. | Date | Time | Noise Levels, Leq(h), dBA | | Deviation, dB | Applied Adjustment, dB |
|---|---|---|---|---|---|---|---|---|
| | | | | | Measured | Modeled | | |
| 1 | ST1 | R1.7 | 06/08/10 | 1:40 PM | 64.6 | 65.2 | 0.6 | -- |
| 2 | LT1 | R1.12 | 06/08/10 | 12:40 PM | 58.6 | 58.4 | -0.2 | -- |
| 3 | LT1A | R1.16 | 06/07/10 | 12:20 PM | 58.0 | 58.8 | 0.8 | -- |
| 4 | LT1B | R1.30 | 06/07/10 | 12:20 PM | 57.0 | 56.9 | -0.1 | -- |
| 5 | LT3 | R1.71 | 06/08/10 | 12:40 PM | 64.7 | 64.8 | 0.1 | -- |
| 6 | LT2 | R1.49 | 06/08/10 | 12:40 PM | 61.1 | 60.7 | -0.4 | -- |
| 7 | LT4 | R1.62 | 06/08/10 | 12:40 PM | 58.3 | 62.1 | 3.8 | -4.0 |
| 8 | LT5 | R1.92 | 06/10/10 | 10:00 AM | 66.2 | 66.2 | 0.0 | -- |
| 9 | ST9A | R1.94 | 06/10/10 | 10:00 AM | 56.3 | 56.1 | -0.2 | -- |
| 10 | LT6 | R2.3 | 06/10/10 | 11:20 AM | 64.4 | 64.1 | -0.3 | -- |
| 11 | ST12 | R2.13 | 06/10/10 | 11:20 AM | 56.5 | 57.3 | 0.8 | -- |
| 12 | LT7 | R2.19 | 06/10/10 | 12:00 PM | 67.0 | 65.4 | -1.6 | +2.0 |

Source: Parsons, 2010

## Table 6-3. Noise Model Calibration (Cont'd)

| Calibration Site | Measurement Site | Modeled Rec. No. | Date | Time | Noise Levels, $L_{eq(h)}$, dBA | | Deviation, dB | Applied Adjustment, dB |
|---|---|---|---|---|---|---|---|---|
| | | | | | Measured | Modeled | | |
| 13 | ST13 | R2.28 | 06/10/10 | 12:00 PM | 57.5 | 60.1 | 2.6 | -3.0 |
| 14 | LT9 | R2.56 | 06/16/10 | 11:20 AM | 65.4 | 65.2 | -0.2 | -- |
| 15 | LT10 | R2.65 | 06/16/10 | 11:20 AM | 65.9 | 66.0 | 0.1 | -- |
| 16 | LT11 | R2.84 | 06/14/10 | 11:40 AM | 65.4 | 65.1 | -0.3 | -- |
| 17 | LT13 | R3.9 | 06/15/10 | 10:20 AM | 66.2 | 66.2 | 0.0 | -- |
| 18 | CAL18 | R3.28A | 08/31/10 | 12:47 PM | 63.9 | 66.6 | 2.7 | -2.5 |
| 19 | ST25A | R3.60 | 06/15/10 | 10:20 AM | 60.2 | 59.3 | -0.9 | -- |
| 20 | LT15 | R3.81A | 06/15/10 | 11:20 AM | 65.2 | 65.2 | 0.0 | -- |
| 21 | LT16 | R3.93A | 06/16/10 | 10:20 AM | 65.2 | 65.8 | 0.6 | -- |
| 22 | ST29 | R3.99A | 06/16/10 | 10:20 AM | 61.7 | 64.0 | 2.3 | -2.5 |
| 23 | LT17 | R4.15 | 06/21/10 | 12:40 PM | 64.1 | 64.3 | 0.2 | -- |
| 24 | LT18 | R4.32 | 06/21/10 | 12:40 PM | 71.3 | 70.7 | -0.6 | -- |
| 25 | LT19 | R4.6 | 06/21/10 | 12:40 PM | 66.2 | 67.1 | 0.9 | -- |
| 26 | LT20 | R4.72 | 06/21/10 | 1:40 PM | 67.5 | 66.6 | -0.9 | -- |
| 27 | LT21 | R4.43 | 06/21/10 | 1:40 PM | 64.6 | 66.4 | 1.8 | -- |
| 28 | LT20A | R4.103 | 06/24/10 | 2:20 PM | 62.5 | 62.2 | -0.3 | -- |
| 29 | LT20B | R4.87 | 06/24/10 | 2:20 PM | 59.0 | 58.1 | -0.9 | -- |
| 30 | ST39 | R5.3 | 06/24/10 | 2:20 PM | 61.7 | 60.9 | -0.8 | -- |
| 31 | LT22 | R5.37 | 06/24/10 | 2:20 PM | 67.6 | 65.8 | -1.8 | +1.8 |
| 32 | LT26 | R6.77 | 06/24/10 | 11:00 AM | 63.5 | 62.4 | -1.1 | -- |

Source: Parsons, 2010

## Table 6-4. Noise Model Calibration Traffic Volumes

| Description of Traffic Lane | Number of Lanes | Total Traffic Volumes | Auto Travel Speeds, mph | Truck Travel Speeds, mph | Hourly Volumes by Vehicle Type | | |
|---|---|---|---|---|---|---|---|
| | | | | | Cars | Medium Trucks | Heavy Trucks |
| *Hourly Traffic Counts for Calibration 1 dated 06/08/2010 from 13:40 to 14:00* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 6 | 7,200 | 70 | 65 | 6,945 | 141 | 114 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 6 | 7,335 | 70 | 65 | 6,978 | 204 | 153 |
| *Hourly Traffic Counts for Calibrations 3 & 4 dated 06/07/2010 from 12:20 to 12:40* | | | | | | | |
| **State Route 73 Northbound Traffic** | | | | | | | |
| NB SR-73 Thru Lanes | 4 | 2,598 | 65 | 65 | 2,535 | 33 | 30 |
| NB Bear St. On-Ramp | 1 | 282 | 10 to 65 | 10 to 65 | 273 | 9 | 0 |
| **State Route 73 Southbound Traffic** | | | | | | | |
| SB SR-73 Thru Lanes | 4 | 2,640 | 65 | 65 | 2,592 | 36 | 12 |
| SB Bear St. Off-Ramp | 1 | 273 | 65 to 10 | 65 to 10 | 270 | 3 | 0 |
| *Hourly Traffic Counts for Calibrations 2, 5, 6, & 7 dated 06/08/2010 from 12:40 to 13:00* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 5 / 8 | 8,421 | 65 | 65 | 8,115 | 186 | 120 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 5 / 8 | 6,945 | 65 | 65 | 6,630 | 126 | 189 |
| SB Fairview Dr. Entrance to SB SR-73 and I-405 | 1 | 1,149 | 50 | 50 | 1,074 | 45 | 30 |
| **NB SR-73 to NB I-405 Connector** | 3 | 1,764 | 55 | 55 | 1,713 | 45 | 6 |
| **SB I-405 to SB SR-73 Connector** | 3 | 2,400 | 55 | 55 | 2,349 | 45 | 6 |
| **NB I-405 / SR-73 Traffic Fairview Off-Ramp** | | | | | | | |
| To Fairview Dr. from NB I-405 | 2 | 495 | 50 | 50 | 465 | 18 | 12 |
| To Fairview Dr. from NB SR-73 | 1 | 354 | 50 | 50 | 345 | 6 | 3 |
| **NB I-405 / SR-73 Traffic Harbor Exits** | | | | | | | |
| To Harbor Blvd. from NB I-405 | 1 | 864 | 50 | 50 | 840 | 12 | 12 |
| To Harbor Blvd. with NB I-405 / SR-73 Counts | 2 | 1,344 | 50 to 10 | 50 to 10 | 1,299 | 33 | 12 |
| **South Coast Drive** | | | | | | | |
| Westbound Thru Lanes | 2 | 774 | 40 | 40 | 774 | 0 | 0 |
| Eastbound Thru Lanes | 2 | 909 | 40 | 40 | 909 | 0 | 0 |
| *Hourly Traffic Counts for Calibration 8 & 9 dated 06/10/2010 from 10:00 to 10:20* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 5 | 7,233 | 70 | 65 | 6,873 | 168 | 192 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 5 | 7,938 | 70 | 65 | 7,518 | 201 | 219 |
| *Hourly Traffic Counts for Calibration 10 & 11 dated 06/10/2010 from 11:20 to 11:40* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 6 | 8,025 | 65 | 65 | 7,587 | 228 | 210 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 6 | 7,302 | 65 | 65 | 7,014 | 168 | 120 |
| SB Talbert Ave. On-Ramp | 1 | 711 | 10 to 65 | 10 to 65 | 663 | 36 | 12 |

## Table 6-4. Noise Model Calibration Traffic Volumes (Cont'd)

| Description of Traffic Lane | Number of Lanes | Total Traffic Volumes | Auto Travel Speeds, | Truck Travel Speeds, | Hourly Volumes by Vehicle Type | | |
|---|---|---|---|---|---|---|---|
| | | | | | Cars | Medium Trucks | Heavy Trucks |
| *Hourly Traffic Counts for Calibration 12 & 13 dated 06/10/2010 from 12:00 to 12:20* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 5 | 6,420 | 70 | 70 and 65 | 6,072 | 165 | 183 |
| NB Brookhurst Ave. Off-Ramp | 1 | 594 | 65 to 10 | 65 to 10 | 588 | 6 | 0 |
| SB Brookhurst Ave. Off-Ramp | 1 | 663 | 65 to 10 | 65 to 10 | 645 | 15 | 3 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 5 | 7,122 | 70 | 70 and 65 | 6,756 | 135 | 231 |
| SB Brookhurst Ave. On-Ramp | 1 | 597 | 10 to 65 | 10 to 65 | 588 | 6 | 3 |
| *Hourly Traffic Counts for Calibrations 14 & 15 dated 06/16/2010 from 11:20 to 11:40* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 5 | 7,416 | 70 | 65 | 7,038 | 180 | 198 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 5 | 7,524 | 70 | 65 | 7,176 | 168 | 180 |
| SB Warner Ave. On-Ramp | 1 | 711 | 10 to 65 | 10 to 65 | 660 | 36 | 15 |
| *Hourly Traffic Counts for Calibration 16 dated 06/14/2010 from 11:40 to 12:00* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 5 | 6,180 | 70 | 65 | 5,832 | 138 | 210 |
| NB Warner Ave. On-Ramp | 1 | 681 | 10 to 65 | 10 to 65 | 666 | 6 | 9 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 5 | 6,504 | 70 | 65 | 6,159 | 135 | 210 |
| SB Warner Ave. Off-Ramp | 1 | 261 | 65 to 10 | 65 to 10 | 249 | 12 | 0 |
| *Hourly Traffic Counts for Calibration 17 dated 06/15/2010 from 10:20 to 10:40* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 5 | 6,162 | 65 | 65 | 5,883 | 126 | 153 |
| NB Magnolia St. On-Ramp | 1 | 981 | 10 to 65 | 10 to 65 | 963 | 15 | 3 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 5 | 6,186 | 65 | 65 | 5,850 | 141 | 195 |
| *Hourly Traffic Counts for Calibration 18 dated 08/31/2010 from 12:47 to 01:07* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 5 | 6,843 | 65 | 65 | 6,492 | 177 | 174 |
| NB Magnolia St. On-Ramp | 1 | 903 | 10 to 65 | 10 to 65 | 873 | 18 | 12 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 5 | 7,347 | 65 | 65 | 6,999 | 159 | 189 |
| SB Magnolia St. Off-Ramp | 1 | 489 | 65 to 10 | 65 to 10 | 480 | 9 | 0 |
| *Hourly Traffic Counts for Calibration 19 dated 06/15/2010 from 10:20 to 10:40* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 5 | 6,162 | 65 | 65 | 5,883 | 126 | 153 |
| NB Beach Blvd. Off-Ramp | 1 | 489 | 65 to 10 | 65 to 10 | 486 | 3 | 0 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 5 | 6,186 | 65 | 65 | 5,850 | 141 | 195 |

## Table 6-4. Noise Model Calibration Traffic Volumes (Cont'd)

| Description of Traffic Lane | Number of Lanes | Total Traffic Volumes | Auto Travel Speeds, | Truck Travel Speeds, | Hourly Volumes by Vehicle Type | | |
|---|---|---|---|---|---|---|---|
| | | | | | Cars | Medium Trucks | Heavy Trucks |
| *Hourly Traffic Counts for Calibration 20 dated 06/15/2010 from 11:20 to 11:40* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 5 | 7,068 | 65 | 65 | 6,708 | 153 | 207 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 5 | 7,365 | 65 | 65 | 7,035 | 153 | 177 |
| *Hourly Traffic Counts for Calibration 21 & 22 dated 06/16/2010 from 10:20 to 10:40* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 5 | 6,894 | 65 | 65 | 6,567 | 141 | 186 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 5 | 6,285 | 65 | 65 | 5,898 | 153 | 234 |
| SB Bolsa Ave. On-Ramp | 1 | 582 | 10 to 65 | 10 to 65 | 564 | 15 | 3 |
| *Hourly Traffic Counts for Calibration 23, 24, & 25 dated 06/21/2010 from 12:40 to 13:00* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 5 | 6,288 | 65 | 65 | 5,979 | 99 | 210 |
| NB Westminster Blvd. Off-Ramp | 1 | 480 | 65 - 10 | 65 - 10 | 468 | 12 | 0 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 5 | 6,972 | 65 | 65 | 6,732 | 93 | 147 |
| SB Westminster Blvd. On-Ramp | 1 | 522 | 10 - 65 | 10 - 65 | 513 | 9 | 0 |
| *Hourly Traffic Counts for Calibration 26 & 27 dated 06/21/2010 from 13:40 to 14:00* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB I-405 Thru Lanes | 5 | 7,014 | 65 | 65 | 6,705 | 84 | 225 |
| NB Westminster Blvd. On-Ramp | 1 | 678 | 10 - 65 | 10 - 65 | 657 | 6 | 15 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB I-405 Thru Lanes | 5 | 6,561 | 65 | 65 | 6,336 | 75 | 150 |
| SB Westminster Blvd. Distributor | 1 | 651 | 55 - 45 | 55 - 45 | 621 | 12 | 18 |
| SB Springdale St. Off-Ramp | 1 | 495 | 65 - 10 | 65 - 10 | 471 | 12 | 12 |
| SB Westminster Blvd. Off-Ramp | 1 | 156 | 65 - 10 | 65 - 10 | 150 | 0 | 6 |
| *Hourly Traffic Counts for Calibration 28 & 29 dated 06/24/2010 from 14:20 to 14:40* | | | | | | | |
| **State Route 22 Eastbound Traffic** | | | | | | | |
| EB SR-22 Thru Lanes | 4 | 3,258 | 65 | 65 | 3,126 | 90 | 42 |
| **State Route Westbound Traffic** | | | | | | | |
| WB SR-22 Thru Lanes | 4 | 3,399 | 65 | 65 | 3,165 | 69 | 165 |
| WB Valley View St. Off-Ramp | 1 | 906 | 65 - 10 | 65 - 10 | 861 | 36 | 9 |
| WB Valley View St. Loop On-Ramp | 1 | 471 | 10 - 65 | 10 - 65 | 459 | 6 | 6 |

## Table 6-4. Noise Model Calibration Traffic Volumes (Cont'd)

| Description of Traffic Lane | Number of Lanes | Total Traffic Volumes | Auto Travel Speeds, | Truck Travel Speeds, | Hourly Volumes by Vehicle Type | | |
|---|---|---|---|---|---|---|---|
| | | | | | Cars | Medium Trucks | Heavy Trucks |
| *Hourly Traffic Counts for Calibration 30 & 31 dated 06/24/2010 from 14:20 to 14:40* | | | | | | | |
| **Interstate 405 Northbound Traffic** | | | | | | | |
| NB 405 south of SR 22 | 5 | 7,479 | 65 | 65 | 7,083 | 195 | 201 |
| **Interstate 405 Southbound Traffic** | | | | | | | |
| SB 405 south of SR 22 | 5 | 8,232 | 65 | 65 | 7,965 | 126 | 141 |
| **State Route 22 Eastbound Traffic** | | | | | | | |
| EB SR 22 east of I-405 | 3 | 3,258 | 65 | 65 | 3,126 | 90 | 42 |
| EB Valley View St. On-Ramp | 1 | 816 | 10 - 65 | 10 - 65 | 807 | 9 | 0 |
| **State Route 22 Westbound Traffic** | | | | | | | |
| WB SR 22 east of I-405 | 3 | 3,399 | 65 | 65 | 3,165 | 69 | 165 |
| WB Valley View St. Off-Ramp | 1 | 906 | 65 - 10 | 65 - 10 | 861 | 36 | 9 |
| WB Valley View St. (NB) On-Ramp | 1 | 471 | 10 - 65 | 10 - 65 | 459 | 6 | 6 |
| WB Valley View St. (SB) On-Ramp | 1 | 639 | 10 - 65 | 10 - 65 | 615 | 15 | 9 |
| *Hourly Traffic Counts for Calibration 32 dated 06/24/2010 from 11:00 to 11:20* | | | | | | | |
| **Interstate 605 Northbound Traffic** | | | | | | | |
| NB I-605 Thru Lanes | 6 | 4,395 | 65 | 65 | 4,209 | 96 | 90 |
| **Interstate 605 Southbound Traffic** | | | | | | | |
| SB I-605 Thru Lanes | 4 | 3,822 | 65 | 65 | 3,672 | 78 | 72 |

# Chapter 7. Future Noise Environment, Impacts, and Considered Abatement

This noise study was conducted to determine future traffic noise impacts of the proposed project at frequent human use areas within the freeway corridor. The future worst case traffic noise impact at frequent outdoor human use areas along the project corridor was modeled for the No Build Alternative and three Build Alternatives (Alternatives 1, 2, and 3), in order to determine appropriate abatement measures. This section discusses the future noise environment and feasible noise abatement measures for impacted locations.

## 7.1. Future Noise Environment and Impacts

Tables in Appendix G summarize traffic noise levels for the existing, design-year No Build, and design-year Build conditions. Predicted design-year Build traffic noise levels are compared to existing conditions. The comparison to existing conditions is included in the analysis to identify traffic noise impacts under Title 23 CFR 772. The comparison of existing noise conditions to future No Build conditions indicates the direct effect of the project.

As stated in the TeNS, modeling results are rounded to the nearest decibel before comparisons are made. In some cases, this can result in relative changes that may not appear intuitive. An example would be a comparison between sound levels of 64.4 and 64.5 dBA. The difference between these two values is 0.1 dB. However, after rounding, the difference is reported as 1 dB.

Modeling results in Appendix G indicate that predicted traffic noise levels ($L_{eq[h]}$) for the design-year with-project conditions approach or exceed the NAC of 67 dBA for Activity Category B land uses at most of residences near I-405 throughout the study corridor. Therefore, traffic noise impacts are predicted to occur at Activity Category B land use within the project area. Accordingly, noise abatement must be considered at those locations.

## 7.2. Preliminary Noise Abatement Analysis

In accordance with Title 23 CFR 772, noise abatement is considered where traffic noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. Potential noise abatement measures identified in the Protocol include the following:

- Avoiding the impact by using design alternatives, such as altering the horizontal and vertical alignment of the project;
- Constructing noise barriers;
- Acquiring property to serve as a buffer zone;
- Using traffic management measures to regulate types of vehicles and speeds; and
- Acoustically insulating public-use or nonprofit institutional structures.

These abatement options have been considered. However, because of the constrained configuration and suburban location of the project, abatement in the form of noise barrier walls is the only abatement measure considered to be feasible. Noise barrier analysis was conducted by placing soundwalls at the highway mainline shoulders, on/off-ramp shoulders, right-of-way

lines, and in one case within private property. Predicted noise levels are shown in Appendix G, and tables showing top-of-wall heights of feasible sound walls are included in Appendix H.

Each noise barrier has been evaluated for feasibility based on achievable noise reduction (5 dB or more). For each noise barrier determined to be acoustically feasible, reasonable cost allowances were calculated. Worksheets provided in Appendix I summarize the reasonable cost allowance calculations at critical design receivers based on the allowance calculation procedure identified in the Protocol. Refer to the Protocol for the definition of the critical design receiver. Tables in Appendix G summarize the results at receiver locations for soundwalls that have been evaluated in detail for this project.

To be considered reasonable from a cost perspective, the estimated cost to build the noise barrier should be equal to or less than the total cost allowance of benefited receivers calculated for the barrier. The cost calculations of the noise barrier should include all items appropriate and necessary for construction of the barrier, such as traffic control, drainage modification, retaining walls, and among others. Construction cost estimates are not provided in this NSR, but are presented in the Noise Abatement Decision Report (NADR). The NADR is a design responsibility and is prepared to compile information from the NSR, other relevant environmental studies, and design considerations into a single, comprehensive document before public review of the project. The NADR is prepared by the project engineer after completion of the NSR and prior to publication of the draft environmental document. The NADR includes noise abatement construction cost estimates that have been prepared and signed by the project engineer based on site-specific conditions. Construction cost estimates are compared to reasonableness allowances in the NADR to identify which wall configurations are reasonable from a cost perspective.

The design of noise barriers presented in this report is preliminary and has been conducted at a level appropriate for environmental review and not for final design of the project. Preliminary information on the physical location, length, and height of noise barriers is provided in this report. If pertinent parameters change substantially during the final project design, preliminary noise barrier designs may be modified or eliminated from the final project. A final decision on the construction of location specific noise abatement will be made upon completion of the project design.

The analysis was conducted with barrier heights ranging from 8 to 16 feet. The barriers heights and locations were evaluated to determine if a minimum 5 dB attenuation at the outdoor frequent use areas of the representative receivers could be achieved. The reason for limiting the maximum sound wall height to 16 feet above the ground line is to comply with the suggestions set forth by Highway Design Manual (Caltrans, 2007). The minimum barrier height required to cut the line-of-sight from each receiver to the exhaust stacks of heavy trucks has been calculated for all feasible barriers. These heights were evaluated through calculations performed by TNM 2.5.

Throughout the project area, there are existing soundwalls which currently protect the majority of outdoor frequent use areas from freeway traffic noise. These existing soundwalls fall into one of two categories: soundwalls that will remain and soundwalls that will need to be demolished due to the project. For those soundwalls which will remain intact because the project widening will not encroach upon them, analysis was conducted for barrier heights above the existing

heights at the same location. For soundwalls which will need to be demolished due to the widening of the alignment or due to other construction details such as the construction of retaining walls, it has been assumed that in-kind replacement soundwalls will be constructed as part of the project. These in-kind replacement soundwalls would be the same length and height as the soundwall it is replacing but at a new and typically similar location and have been included in the noise analysis. The noise prediction analysis with barrier of these in-kind replacement soundwalls are of heights that are greater than the in-kind heights.

The minimum heights and locations of the soundwalls that would provide feasible abatement are shown graphically on the figures in Appendix A. Worksheets of the cost analysis for the feasible soundwalls are included in Appendix I.

The following discussion considers six segments of the corridor where feasible abatement was identified and warranted. Tables 7-1 through Table 7-70 summarize the data used to assess the abatement cost allowances at each of the considered barrier heights. The following analysis presents predicted future traffic noise levels at various receivers and abatement measures for the three Build Alternatives. In most cases, feasible wall heights and the number of benefited residences between the three alternatives are similar throughout the corridor.

### 7.2.1. Alternative 1

Tables G-1 through G-6 in Appendix G present the results of the barrier analysis. Tables H-1 through H-6 in Appendix H present a summary of soundwall locations and the minimum heights and lengths to achieve at least 5 dB of noise reduction. Appendix H also presents the locations, heights, and lengths of in-kind replacement soundwalls that do not provide feasible abatement. The project limits of the noise analysis for Alternative 1 are from south of Euclid Street to the I-605 interchange. Figures 5 through 26 in Appendix A1 show the proposed alignment of Alternative 1.

#### 7.2.1.1. SEGMENT 1 – SOUTH OF BRISTOL STREET TO EUCLID STREET

##### *Areas with Noise Abatement*

***Soundwall S649:*** Soundwall S649 would be an in-kind replacement of the existing 12-foot high soundwall and would be located at the southbound edge of shoulder. This soundwall would need to be replaced due to the widening of I-405 in this area. Soundwall S649 would tie into a solid 3-foot safety barrier on the structure of the southbound on-ramp from Euclid Street. The solid 3-foot high safety barrier along the on-ramp is considered in the noise impact analysis and it must be kept for noise reduction in addition to the safety related issues. Traffic noise impacts are predicted within the outdoor frequent use areas of 14 single-family residences in this area but this soundwall would not provide 5 dB or more of traffic noise reduction. Figures 5 and 6 in Appendix A1 show the location and height of in-kind replacement Soundwall S649.

##### *Areas without Feasible Noise Abatement*

***Receivers R1.88 through R1.90, R1.92, R1.93, and R1.95***: Traffic noise impacts would occur at 25 single-family residences along the southbound side of I-405 between New Hampshire Drive and Nevada Avenue despite the presence of existing 14- and 16-foot high soundwalls as well as a 12-foot high in-kind replacement soundwall. The soundwall analysis summarized in Table G-1 demonstrates that replacing the existing soundwall with one at a greater height and increasing the height of the in-kind replacement soundwall would not provide 5 dB or more noise reduction at these residences. Figure 5 in Appendix A1 shows these receivers.

#### 7.2.1.2. SEGMENT 2 – EUCLID STREET TO MAGNOLIA STREET

### *Areas with Noise Abatement*

***Soundwalls S699 and S705:*** Soundwalls S699 and S705 would be in-kind replacements of the existing 16- and 12-foot high soundwalls due to the widening of I-405 in this area. These soundwalls would be located at the southbound right-of-way and edge of shoulder. Soundwall S699 will be on a retaining wall. Traffic noise impacts are not predicted under Alternative 1 with replacement of these existing soundwalls. Figures 7 and 8 in Appendix A1 show the location and height of these in-kind replacement Soundwalls S699 and S705.

***Soundwalls S708, S710, and S718***: These soundwalls which act as a system would be located along the northbound I-405 edge of shoulder and right-of-way line. The purpose of Soundwall S708 is to extend the coverage to the south of in-kind replacement Soundwall S710 to compensate for the encroachment of I-405 onto the existing overcrossing embankment that would occur under Alternative 1. The reconfigured embankment would increase the exposure to three single-family residences to freeway traffic noise. Soundwall S718, which is a new soundwall, would extend in-kind replacement Soundwall S710 further to the north and would end where the retaining wall with safety barrier begins along the northbound Brookhurst Street off-ramp. Due to the elevation differences, the solid 3-foot high safety barrier along the off-ramp is considered in the noise impact analysis and it must be kept for noise reduction in addition to the safety related issues. Traffic noise impacts are predicted at 24 single family residences and Los Alamos Park. Together, Soundwalls S708, S710, and S718 would provide at least 5 dB of noise reduction for 21 single-family residences. A 5 dB noise reduction would not be achieved at three single-family residences represented by Receivers R2.14 and R2.17 as well as Los Alamos Park represented by Receiver R2.15. Figures 7 and 8 in Appendix A1 show the minimum heights and lengths of Soundwalls S708, S710, and S718 to provide feasible abatement. Table 7-1 summarizes predicted soundwall performance and associated cost allowance information.

***Soundwall S733:*** Soundwall S733 would be located at the shoulder of the southbound off-ramp to Brookhurst Street along the southbound side of I-405 and connects to the safety barrier on top of the retaining wall. Due to the elevation differences, the solid 3-foot high safety barrier along the off-ramp is considered in the noise impact analysis and it must be kept for noise reduction in addition to the safety related issues. Traffic noise impacts are predicted within the outdoor frequent use areas of a single-family residence in this area. Soundwall S733 would provide at least 5 dB of noise reduction for this residence. Figure 8 in Appendix A1 shows the minimum heights and length of Soundwall S733 to provide feasible abatement. Table 7-2 summarizes predicted soundwall performance and associated cost allowance information.

### Table 7-1. Summary of Reasonableness Determination Data – Alternative 1 – Soundwalls S708, S710, and S718

| Barrier I.D.: S708, S710, & S718 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R2.20 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 67 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 1 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 1 | 2 | 4 | 7 | 7 |
| Number of Benefited Residences | N/A | N/A | N/A | 19 | 21 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | N/A | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | N/A | $45,000 | $45,000 |
| Total Reasonable Allowance | N/A | N/A | N/A | $855,000 | $945,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

### Table 7-2. Summary of Reasonableness Determination Data – Alternative 1 – Soundwall S733

| Barrier I.D.: S733 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R2.34 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 66 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 0 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 3 | 4 | 4 | 5 | 6 |
| Number of Benefited Residences | N/A | N/A | N/A | 1 | 1 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | N/A | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | N/A | $43,000 | $45,000 |
| Total Reasonable Allowance | N/A | N/A | N/A | $43,000 | $45,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S746***: Soundwall S746 would be located along the right-of-way line on the northbound side of I-405. This soundwall would extend an existing soundwall to the south and would also extend the coverage of the adjoining existing soundwall to compensate for the encroachment of I-405 onto the existing Slater Avenue overcrossing embankment that would occur under Alternative 1. The reconfigured embankment would increase the exposure of nearby homes to freeway traffic noise. Traffic noise impacts are predicted at one single-family residence represented by Receiver R2.45 as well as at the preschool playground associated with

Huntington Baptist Church represented by Receiver R2.46. Soundwall S746 would provide at least 5 dB of noise reduction for the single-family residence and the playground of the school. Figure 9 in Appendix A1 shows the minimum height and length of Soundwall S746 to provide feasible abatement. Table 7-3. summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-3. Summary of Reasonableness Determination Data – Alternative 1 – Soundwall S746**

| Barrier I.D.: S746 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R2.46 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 74 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 6 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 5 | 6 | 7 | 7 | 7 |
| Number of Benefited Residences | 1 | 2 | 2 | 2 | 2 |
| New Highway or More than 50% of Residences Predate 1978[b] | Yes | Yes | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | $47,000 | $49,000 | $49,000 | $49,000 | $49,000 |
| Total Reasonable Allowance | $47,000 | $98,000 | $98,000 | $98,000 | $98,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S747***: This soundwall would be located at the right-of-way line and inside the right-of-way along the southbound side of I-405 and would extend an existing soundwall to the south. Traffic noise impacts in this area are predicted within the outdoor frequent use areas of two single-family residences and two frontage units of an athletic field of Fountain Valley High School. Soundwall S747 would also extend the coverage of the adjoining existing soundwall to compensate for the encroachment of I-405 onto the existing overcrossing embankment that would occur under Alternative 1. The reconfigured embankment would increase the exposure of nearby homes and apartment complex to freeway traffic noise. Soundwall S747 would provide at least 5 dB of noise reduction for the two single-family residences and two frontage units of the athletic field. Figure 9 in Appendix A1 shows the minimum heights and length of Soundwall S747 to provide feasible abatement. Table 7-4 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-4. Summary of Reasonableness Determination Data – Alternative 1 – Soundwall S747**

| Barrier I.D.: S747 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R2.41 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 71 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 4 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 4 | 4 | 5 | 6 | 6 |
| Number of Benefited Residences | N/A | N/A | 1 | 1 | 4 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | No | No | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | $37,000 | $39,000 | $49,000 |
| Total Reasonable Allowance | N/A | N/A | $37,000 | $39,000 | $196,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S765***: This soundwall would be located along the southbound I-405 right-of-way line. The purpose of Soundwall S765 is to extend the coverage of an existing 16-foot high soundwall and an existing 14-foot high property wall to compensate for the encroachment of I-405 onto the existing Bushard Street overcrossing embankment that would occur under Alternative 1. The reconfigured embankment would increase the exposure to three single-family residences to freeway traffic noise. Traffic noise impacts are predicted within the outdoor frequent use areas of four single-family residences in this area but this soundwall would not provide 5 dB or more of traffic noise reduction. Figure 9 in Appendix A1 shows the location and height of Soundwall S765.

***Soundwall S766***: Soundwall S766 would be located along the northbound I-405 right-of-way line. The purpose of Soundwall S766 is to extend the coverage of an existing 14-foot 6-inch high soundwall to the north to compensate for the encroachment of I-405 onto the existing Bushard Street overcrossing embankment that would occur under Alternative 1. The reconfigured embankment would increase the exposure to six single-family residences to freeway traffic noise. Traffic noise impacts are predicted within the outdoor frequent use areas of four single-family residences in this area but this soundwall would not provide 5 dB or more of traffic noise reduction. Figure 9 in Appendix A1 shows the location and height of Soundwall S766.

***Soundwalls S788 and S792***: Soundwalls S788 and S792 which act as a system would be located along the northbound off-ramp to Magnolia Street. The purpose of Soundwall S788 is to extend the coverage to the south of Soundwall S792 to compensate for the exposure of freeway traffic noise to five single-family residences due to the opening provided by the structure of the northbound on-ramp from Warner Avenue over the northbound off-ramp to Magnolia Street. Soundwall S792 is an in-kind replacement of existing soundwall. Furthermore, due to the configuration of these ramps, absorptive materials/panels will be required on the traffic side of

Soundwall S792 and on the retaining wall associated with the Warner Avenue on-ramp to prevent the traffic noise from reflecting between the soundwall and retaining wall. Traffic noise impacts are predicted within the outdoor frequent use areas of nine single-family residences in this area but this soundwall would not provide 5 dB or more of traffic noise reduction. Figures 10 and 11 in Appendix A1 show the location and height of Soundwalls S788 and S792.

### *Areas without Feasible Noise Abatement*

***Receivers R2.14, R2.15, and R2.17***: Traffic noise impacts would occur at three single family residences as well as Los Alamos Park along the northbound side of I-405 just north of Talbert Avenue. These receivers would be protected by Soundwalls S708, S710, and S718; however, the soundwall analysis summarized in Table G-2 demonstrates that increasing the heights of these soundwalls would not provide 5 dB or more of noise reduction at the three impacted residences and the park. Figures 7 and 8 in Appendix A1 show these receivers.

***Receivers R2.35 and R2.37 through R2.39***: Traffic noise impacts would occur at 11 single-family residences along the southbound side of I-405 between Sturgeon Avenue and Fremont Street despite the presence of an existing 12-foot high property wall. The soundwall analysis summarized in Table G-2 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more noise reduction at these residences. Figures 8 and 9 in Appendix A1 show these receivers.

***Receivers R2.47 through R2.49, R2.51 through R2.53, R2.55, and R2.56***: Traffic noise impacts would occur at 23 first row single family residences along the northbound side of I-405 between Slater Avenue and Bushard Street. These receivers are protected by an existing 14-foot 6-inch high existing soundwall. The soundwall analysis is summarized in Table G-2 demonstrates that a higher replacement soundwall would not provide 5 dB or more of noise reduction at the 23 impacted residences. Figure 9 in Appendix A1 shows these receivers.

***Receivers R2.58 and R2.59***: Traffic noise impacts would occur at four single-family residences along the northbound side of I-405 just south of Bushard Street despite the addition of the new Soundwall S766. The soundwall analysis summarized in Table G-2 demonstrates that the addition of Soundwall S766 would not provide 5 dB or more of noise reduction at these residences. Figure 9 in Appendix A1 shows these receivers.

***Receivers R2.63 through R2.66***: Traffic noise impacts would occur at the frequent outdoor use areas of seven first row single-family residences along the southbound side of I-405 between Bushard Street and Warner Avenue despite the presence of an existing 14-foot high property wall and the addition of the new Soundwall S765. Receivers R2.65 and R2.66 are located in the new Tremont housing development. The soundwall analysis summarized in Table G-2 demonstrates that replacing the existing property wall with one at a greater height and the addition of Soundwall S765 would not provide 5 dB or more of noise reduction at these residences. Figures 9 through 10 in Appendix A1 show these receivers.

***Receivers R2.81, R2.82, and R2.85***: Traffic noise impacts would occur at nine single-family residences along the northbound side of I-405 between Warner Avenue and Magnolia Street despite the addition of Soundwall S788 and in-kind replacement Soundwall S792. The soundwall analysis summarized in Table G-2 demonstrates that increasing the heights of

Soundwalls S788 and S792 would not provide 5 dB or more of noise reduction at these residences. Figure 10 Appendix A1 shows these receivers.

#### 7.2.1.3. SEGMENT 3 – MAGNOLIA STREET TO BOLSA AVENUE / GOLDENWEST STREET

### *Areas with Noise Abatement*

***Soundwalls S807 and S811***: Soundwall S807 would be located at the edge of the shoulder along the southbound I-405 off-ramp at Magnolia Street. It would provide a southward extension of the coverage currently provided by an existing soundwall. The southernmost portion of the existing 10 feet 6 inch soundwall would be replaced by Soundwall S811, which is an in-kind replacement and would follow the right-of-way line. Soundwall S811 would be higher than the portion of existing soundwall it would replace. Traffic noise impacts are predicted at Pleasant View Park and at two residences within this area. Soundwalls S807 and S811 together would provide at least 5 dB of noise reduction at the residences and at seven frontage units associated with the park. Figure 11 in Appendix A1 shows the minimum heights and length of Soundwalls S807 and S811 to provide feasible abatement along with the portion of the associated existing soundwall that would remain. Table 7-5 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-5. Summary of Reasonableness Determination Data – Alternative 1 – Soundwalls S807 and S811**

| Barrier I.D.: S807 & S811 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.23B | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 68 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 5 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 3 | 4 | 6 | 6 | 7 |
| Number of Benefited Residences | NA | NA | 7 | 9 | 9 |
| New Highway or More than 50% of Residences Predate 1978[b] | NA | NA | No | No | No |
| Reasonable Allowance Per Benefited Residence | NA | NA | $37,000 | $37,000 | $37,000 |
| Total Reasonable Allowance | NA | NA | $259,000 | $333,000 | $333,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S819***: Soundwall S819 would follow the right-of-way line along the southbound side of I-405. It would replace a portion of the existing 12 feet 6 inch soundwall in this area which would need to be demolished due to the construction of a new pedestrian overcrossing. With the replacement soundwall, outdoor frequent use areas at three first-row single family residences that are positioned behind this segment of soundwall would experience no traffic noise impacts. Figure 11 in Appendix A1 shows the height and location of Soundwall S819 to provide in-kind replacement for the existing soundwall along with the portions of the associated existing soundwall that would remain.

***Soundwall S828***: Soundwall S828 would be located at the edge of shoulder along the northbound side of the I-405 mainline and the westbound Magnolia Street to northbound I-405 on-ramp. The southern portion of this soundwall would replace the majority of an existing 10 feet 6 inch soundwall, leaving only the southernmost portion of the existing soundwall. The northern portion of Soundwall S828 would be a new soundwall. Soundwall S828 would be a higher soundwall than the portion of existing soundwall it would replace. If the replacement soundwall is not increased relative to the existing soundwall, traffic noise impacts are predicted at the outdoor frequent use areas associated with 28 of the residences – two ground-level multifamily residential units and 26 single family residences. Soundwall S828 would provide at least 5 dB of noise reduction at eight of these residences – three that are currently behind the existing soundwall and five that are north of the existing soundwall. Based on a design that focuses on abatement at impacted residences, this soundwall would provide feasible abatement at three additional single family residences as well. Figures 11 and 12 in Appendix A1 show the minimum heights and length of Soundwall S828 to provide feasible abatement along with the portion of the associated existing soundwall that would remain. Table 7-6 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-6. Summary of Reasonableness Determination Data – Alternative 1 – Soundwall S828**

| Barrier I.D.: S828 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.16 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 71 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 1 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | NA | NA | NA | NA | 5 |
| Number of Benefited Residences | NA | NA | NA | NA | 12 |
| New Highway or More than 50% of Residences Predate 1978[b] | NA | NA | NA | NA | Yes |
| Reasonable Allowance Per Benefited Residence | NA | NA | NA | NA | $45,000 |
| Total Reasonable Allowance | NA | NA | NA | NA | $540,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S841***: Soundwall S841 would be located at the edge of shoulder along the southbound side of I-405. The purpose of Soundwall S841 is to extend the coverage of the adjoining existing 12 feet 6 inch soundwall to the south and carport / property wall to the north to compensate for the removal of some of the existing embankment at the Newland Street overcrossing. A gap would be created due to the construction of a longer bridge, requiring the embankment to be moved outward. That change in the embankment configuration would increase the exposure of nearby receivers to freeway traffic noise. Traffic noise impacts are predicted within the outdoor frequent use areas of four of the residences and at a basketball court located near the gap. Soundwall S841 would provide at least 5 dB of noise reduction at each of these receivers as well as two non-impacted residences. At two of the impacted residences –

represented by Receivers R3.48 and R3.50 -- the predicted peak hour noise level is at or above 75 dBA without a soundwall in place; thus, these residences would be considered severely impacted. Where severe impacts are identified, unusual and extraordinary abatement must be considered. If Soundwall S841 is determined to be unreasonable based on cost, providing the soundwall will still be required for these residences. If building a soundwall is not reasonable due to other factors besides cost, then building acoustical treatment must be provided for these two houses. Figure 12 in Appendix A1 shows the minimum heights and length of Soundwall S841 to provide feasible abatement along with the associated soundwall and carport structure / property wall that would flank it. Table 7-7 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-7. Summary of Reasonableness Determination Data – Alternative 1 – Soundwall S841**

| Barrier I.D.: S841 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.48 | | | | | |
| Design Year Noise Level, dBA $L_{eq}(h)$: 76 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 9 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 7 | 9 | 11 | 11 | 12 |
| Number of Benefited Residences | 2 | 2 | 5 | 6 | 7 |
| New Highway or More than 50% of Residences Predate 1978[b] | Yes | Yes | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | $53,000 | $55,000 | $55,000 | $55,000 | $57,000 |
| Total Reasonable Allowance | $106,000 | $110,000 | $275,000 | $330,000 | $399,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S857***: Soundwall S857 would be located at the edge of shoulder along the southbound I-405 on-ramp at Edinger Avenue. Without abatement, traffic noise impacts are predicted at outdoor frequent use areas associated with seven ground-floor multifamily residential units. Soundwall S857 would provide at least 5 dB of noise reduction at each of these residential units. Figures 12 and 13 in Appendix A1 show the minimum heights and length of Soundwall S857 to provide feasible abatement. Table 7-8 summarizes predicted soundwall performance and associated cost allowance information.

### Table 7-8. Summary of Reasonableness Determination Data – Alternative 1 – Soundwall S857

| Barrier I.D.: S857 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.56 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 70 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 3 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 3 | 4 | 5 | 5 | 5 |
| Number of Benefited Residences | NA | NA | 7 | 7 | 7 |
| New Highway or More than 50% of Residences Predate 1978[b] | NA | NA | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | NA | NA | $47,000 | $47,000 | $47,000 |
| Total Reasonable Allowance | NA | NA | $329,000 | $329,000 | $329,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S868***: This soundwall would be located along the right-of-way line on the northbound side of I-405. This soundwall would extend beyond the northernmost portion of an existing 14- to 18-foot high property wall in this area. The outdoor frequent use area of one single-family property represented by Receiver R3.63 would experience traffic noise impacts in the absence of abatement. Soundwall S868 would provide feasible noise abatement at this residence. Figure 13 in Appendix A1 shows the minimum height and length of Soundwall S868 to provide feasible abatement along with the portion of the adjoining property wall. Table 7-9 summarizes predicted soundwall performance and associated cost allowance information.

### Table 7-9. Summary of Reasonableness Determination Data – Alternative 1 – Soundwall S868

| Barrier I.D.: S868 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.63 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 66 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 1 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 2 | 2 | 3 | 4 | 6 |
| Number of Benefited Residences | NA | NA | NA | NA | 1 |
| New Highway or More than 50% of Residences Predate 1978[b] | NA | NA | NA | NA | No |
| Reasonable Allowance Per Benefited Residence | NA | NA | NA | NA | $35,000 |
| Total Reasonable Allowance | NA | NA | NA | NA | $35,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S896***: Soundwall S896 would be located along the right-of-way line on the northbound side of I-405. This soundwall would extend underneath the McFadden Avenue overcrossing. The purpose of Soundwall S896 is to extend the coverage of the adjoining existing soundwall to compensate for the encroachment of I-405 onto the existing overcrossing embankment that would occur under Alternative 1. The reconfigured embankment would increase the exposure of nearby mobile homes to freeway traffic noise. Traffic noise impacts are predicted within the outdoor frequent use areas of five mobile homes. Soundwall S896 would not provide 5 or more dB of noise reduction at these residences but it would prevent additional noise exposure from reconfiguration of the bridge embankment. Figure 14 in Appendix A1 shows the height and length of Soundwall S896 along with the existing soundwall that it would connect with.

***Soundwalls S902, S910, and S916***: Soundwalls S902, S910, and S916 would be located at the edge of shoulder along the northbound side of I-405. Soundwalls S902 and S910 would represent an in-kind replacement of an existing 8-foot high soundwall. Soundwall S902 would be at the same height as the original soundwall but Soundwall S910 would be higher. Soundwall S916 would be a new soundwall. Traffic noise impacts are predicted at the outdoor frequent use areas of five single family residences behind Soundwall S902. These residences are represented by Receivers R3.81 and R3.81A. Greater heights were considered for Soundwall S902, but these greater heights would not provide 5 or more dB of additional noise reduction at these residences. Soundwalls S910 and S916 together are intended to provide abatement at seven single family residences represented by Receivers R3.85 to R3.86A. Together, they would provide at least 5 dB of noise reduction for each of these seven residences. Figure 14 in Appendix A1 shows the heights and lengths of replacement Soundwall S902 as well as the minimum heights for Soundwalls S910 and S916 to provide feasible abatement. Table 7-10 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-10. Summary of Reasonableness Determination Data – Alternative 1 – Soundwalls S910 and S916**

| Barrier I.D.: S910 & S916 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.86A | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 66 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 1 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 3 | 4 | 5 | 6 | 7 |
| Number of Benefited Residences | NA | NA | 5 | 7 | 7 |
| New Highway or More than 50% of Residences Predate 1978[b] | NA | NA | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | NA | NA | $43,000 | $45,000 | $45,000 |
| Total Reasonable Allowance | NA | NA | $215,000 | $315,000 | $315,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwalls S909, S911, and S141***: Soundwalls S909, S911, and S141 would be located at the edge of shoulder along the southbound side of I-405. Soundwalls S911 and S141 would replace two existing soundwalls -- one 8-foot high soundwall at the edge of shoulder and one 12 feet 6 inch high soundwall along the right-of-way line. Soundwall S911 would be a higher soundwall than the portion of existing soundwall it would replace. Relative to its base, Soundwall S141 would not be as tall as the existing 12 feet 6 inch high soundwall. However, the base of Soundwall S141 would be at a higher elevation than the existing 12 feet 6 inch high soundwall, and the elevation of the top of Soundwall S141 would not be below the top-of-wall elevation of the existing soundwall. Traffic noise impacts are predicted within the outdoor frequent use areas of 27 single family residences in this area. Raising in-kind replacement Soundwall S141 above the heights of the existing replaced soundwalls would not provide 5 or more dB of noise reduction at these residences for its entire length except for a small portion on the south end. Traffic noise impacts are also predicted at College Park. Soundwalls S909 and S911 would combine to provide at least 5 dB of noise reduction for this park. Figures 14 and 15 in Appendix A1 show the minimum heights and lengths of Soundwalls S909 and S911 to provide feasible abatement, as well as the height and location of in-kind replacement Soundwall S141. Table 7-11 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-11. Summary of Reasonableness Determination Data – Alternative 1 – Soundwalls S909 and S911**

| Barrier I.D.: S909 & S911 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.87 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 67 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 2 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 4 | 5 | 6 | 6 | 6 |
| Number of Benefited Residences | NA | 4 | 4 | 6 | 6 |
| New Highway or More than 50% of Residences Predate 1978[b] | NA | Yes | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | NA | $43,000 | $45,000 | $45,000 | $45,000 |
| Total Reasonable Allowance | NA | $172,000 | $180,000 | $270,000 | $270,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S935***: This soundwall would follow the right-of-way line along the southbound I-405 on-ramp from eastbound Bolsa Avenue. It would connect an existing soundwall to an existing 6-foot high property wall south of Bolsa Avenue. Without abatement, traffic noise impacts are predicted within the outdoor frequent use area of one residence in this area. With minimum feasible soundwall heights, one house would receive 5 or more dB of noise reduction. Figure 15 in Appendix A1 shows the minimum height and length of Soundwall S935 to provide feasible abatement along with the adjacent replacement soundwall and property wall. Table 7-12 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-12. Summary of Reasonableness Determination Data – Alternative 1 – Soundwall S935**

| Barrier I.D.: S935 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.99 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 66 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 3 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 2 | 3 | 4 | 5 | 5 |
| Number of Benefited Residences | NA | NA | NA | 3 | 5 |
| New Highway or More than 50% of Residences Predate 1978[b] | NA | NA | NA | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | NA | NA | NA | $45,000 | $45,000 |
| Total Reasonable Allowance | NA | NA | NA | $135,000 | $225,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

### *Areas without Feasible Noise Abatement*

***Receivers R3.7 through R3.10, R3.14, R3.17, and R3.18***: At 17 first row single family residences along the northbound side of I-405 between Magnolia and Newland Streets, traffic noise impacts would occur but raising the in-kind replacement and the new portions of Soundwall S828 would not provide 5 dB or more of noise reduction. The southern portion of Soundwall S828 would replace an existing 10 feet 6 inch high soundwall. Therefore, the minimum height required to replace this soundwall in kind is 10 feet 6 inches. This establishes the baseline sound exposure condition against which the noise reduction of Soundwall S828 is judged for greater heights. The soundwall analysis summarized in Table G-3 demonstrates that 5 dB or more of noise reduction cannot be achieved at these residences. Figures 11 and 12 in Appendix A1 show these receivers.

***Receivers R3.26 through R3.28***: Traffic noise impacts would occur at eight single-family residences along the southbound side of I-405 between De Ville Circle and Landau Lane despite the presence of an existing 10 feet 6 inch high soundwall. The soundwall analysis summarized in Table G-3 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figure 11 in Appendix A1 shows these receivers.

***Receivers R3.32, R3.35, and R3.38***: Traffic noise impacts would occur at seven single-family residences along the southbound side of I-405 between Heil Avenue and Newland Street despite the presence of an existing 12 feet 6 inch high soundwall. The soundwall analysis summarized in Table G-3 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figures 11 and 12 in Appendix A1 show these receivers.

***Receivers R3.53, R3.54, and R3.55***: Traffic noise impacts would occur at 14 multi-family residential units of the Huntington Creek Apartments along the southbound side of I-405

between Newland Street and Edinger Avenue despite the presence of an intervening existing 15 feet 6 inch high carport structure / property wall. The edge of shoulder in this area is higher than ground level at the carport structure / property wall. Accordingly, a soundwall was considered at the edge of shoulder. The soundwall analysis summarized in Table G-3 demonstrates that such a soundwall would not provide 5 dB or more of noise reduction at these residences. Figure 12 in Appendix A1 shows these receivers.

***Receivers R3.70 through R3.75***: Receivers R3.70 through R3.75 represent 37 units of the Driftwood Mobile Home Park along the northbound side of I-405 between Beach Boulevard and McFadden Avenue. These units would experience traffic noise impacts. The impacts would occur despite the presence of an intervening existing 10 feet 6 inches to 14-foot high soundwall. The soundwall analysis summarized in Table G-3 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figures 13 and 14 in Appendix A1 show these receivers.

***Receivers R3.76 and R3.77***: Receivers R3.76 and R3.77 represent the northernmost five units of the Driftwood Mobile Home Park that would experience traffic noise impacts. The impacts would occur despite the presence of an intervening existing 14-foot high soundwall. In this area, the embankment at the McFadden Avenue overcrossing would be moved outward under Alternative 1 to accommodate the widening of I-405. Soundwall S896 would compensate for the additional noise exposure that the mobile homes would receive due to the reconfiguration of this embankment. However, further increases in the height of Soundwall S896 and the existing soundwall to the south would not provide 5 dB or more of noise reduction at these residences, as demonstrated in Table G-15. Figure 14 in Appendix A1 shows these receivers.

***Receivers R3.81 and R3.81A***: Traffic noise impacts would occur at five single family residences along the northbound side of I-405 north of McFadden Avenue despite the presence of an in-kind replacement 8-foot high soundwall. The soundwall analysis summarized in Table G-3 demonstrates that such a soundwall would not provide 5 dB or more of noise reduction at these residences. Figure 14 in Appendix A1 shows these receivers.

***Receivers R3.93 and R3.93A***: Traffic noise impacts would occur at seven single family residences located behind an existing soundwall positioned at the edge of the freeway shoulder along the southbound side of I-405 north of the Union Pacific Railroad Underpass. The impacts would occur despite the presence of an in-kind replacement for the existing 8-foot high soundwall. The soundwall analysis summarized in Table G-3 demonstrates that raising the replacement soundwall would not provide 5 dB or more of noise reduction at these residences. Figures 14 and 15 in Appendix A1 show these receivers.

***Receivers R3.95, R3.96, and R3.98***: Receivers R3.95, R3.96, and R3.98 represent the northernmost 20 residences north of the Union Pacific Railroad underpass that would experience traffic noise impacts. These impacts would occur despite the presence of the combination of an in-kind replacement of an 8- to 10-foot high soundwall and the portion of an existing 12 feet 6 inch high soundwall that would remain. The soundwall analysis summarized in Table G-3 demonstrates that raising the in-kind replacement soundwall or a higher soundwall replacing the existing soundwall would not provide 5 dB or more of noise reduction at these residences. Figure 15 in Appendix A1 shows these receivers.

### 7.2.1.4. SEGMENT 4 – BOLSA AVENUE / GOLDENWEST STREET TO SR-22 / VALLEY VIEW STREET, SR-22 EAST TO SPRINGDALE STREET

#### *Areas with Noise Abatement*

***Soundwalls S182, S972, and S978***: These soundwalls which act as a system would be located along the northbound I-405 edge of shoulder. Soundwalls S182 and S972 would be in-kind replacement soundwalls; however, Soundwall S972 would be a higher wall than the wall it is replacing. Soundwall S978 would extend Soundwall S972 further to the north. Traffic noise impacts are predicted at 11 single family residences, the track and field area of Westminster High School, and Buckingham Park. Together, Soundwalls S182, S992, and S978 would provide at least 5 dB of noise reduction for three frontage units of the high school and six frontage units of the neighborhood park. Figures 16 and 17 in Appendix A1 show the minimum heights and lengths of Soundwalls S972 and S978 to provide feasible abatement along with the adjoining in-kind soundwall replacement, Soundwall S182. Table 7-13 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-13. Summary of Reasonableness Determination Data – Alternative 1 – Soundwalls S972 and S978**

| Barrier I.D.: S972 & S978 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.25A | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 70 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 1 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 5 | 6 | 7 | 8 | 9 |
| Number of Benefited Residences | 2 | 4 | 6 | 9 | 9 |
| New Highway or More than 50% of Residences Predate 1978[b] | No | No | No | No | No |
| Reasonable Allowance Per Benefited Residence | $35,000 | $37,000 | $37,000 | $37,000 | $39,000 |
| Total Reasonable Allowance | $70,000 | $148,000 | $222,000 | $333,000 | $351,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S995:*** Soundwall S995 would be located at the right-of-way line along the southbound side of I-405. Soundwall S995 would replace an existing soundwall at the same location with a new height. Traffic noise impacts are predicted within the outdoor frequent use areas of five single-family residences in this area. Soundwall S995 would provide at least 5 dB of noise reduction for two of these residences. Figure 17 in Appendix A1 shows the minimum heights and length of Soundwall S995 to provide feasible abatement. Table 7-14 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-14. Summary of Reasonableness Determination Data – Alternative 1 -- Soundwall S995**

| Barrier I.D.: S995 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.1 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 71 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 2 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 0 | 0 | 2 | 4 | 5 |
| Number of Benefited Residences | N/A | N/A | N/A | N/A | 2 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | N/A | N/A | No |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | N/A | N/A | $35,000 |
| Total Reasonable Allowance | N/A | N/A | N/A | N/A | $70,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S998***: This soundwall would be located at the right-of-way line along the northbound side of I-405 and would extend an existing soundwall to the north. Traffic noise impacts are predicted within the outdoor frequent use areas of two single-family residences and a multi-family unit in this area. Soundwall S998 would provide at least 5 dB of noise reduction for the two single-family residences. Figure 17 in Appendix A1 shows the minimum heights and length of Soundwall S995 to provide feasible abatement. Table 7-15 summarizes predicted soundwall performance and associated cost allowance information.

***Soundwall S1006***: Soundwall S1006 would be located along the right-of-way line on the northbound side of I-405. The outdoor pool area of the Motel 6 represented by Receiver R4.33 as well as the interior rooms facing the freeway represented by Receiver R4.33A would experience traffic noise impacts. Furthermore, the pool area is predicted to be exposed to traffic noise levels of above 75 dBA; therefore, it is considered to be severely impacted. Where severe impacts are identified, unusual and extraordinary abatement must be considered. If Soundwall S1006 is determined to be unreasonable based on cost, providing the soundwall will still be required for this hotel. Soundwall S1006 would provide at least 5 dB of noise reduction for the pool and interior of the first floor motel rooms facing the freeway and would reduce to noise level of the pool area to be below the severe impact criteria. Figure 17 in Appendix A1 shows the minimum height and length of Soundwall S1006 to provide feasible. Table 7-16 summarizes predicted soundwall performance and associated cost allowance information.

### Table 7-15. Summary of Reasonableness Determination Data – Alternative 1 -- Soundwall S998

| Barrier I.D.: S998 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.32 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 72 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 1 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 2 | 3 | 4 | 4 | 5 |
| Number of Benefited Residences | N/A | N/A | N/A | N/A | 2 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | N/A | N/A | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | N/A | N/A | $45,000 |
| Total Reasonable Allowance | N/A | N/A | N/A | N/A | $90,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

### Table 7-16. Summary of Reasonableness Determination Data – Alternative 1 – Soundwall S1006

| Barrier I.D.: S1006 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.33 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 77 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 4 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 7 | 8 | 9 | 10 | 11 |
| Number of Benefited Residences | 7 | 7 | 7 | 7 | 7 |
| New Highway or More than 50% of Residences Predate 1978[b] | Yes | Yes | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | $51,000 | $51,000 | $53,000 | $53,000 | $53,000 |
| Total Reasonable Allowance | $357,000 | $357,000 | $371,000 | $371,000 | $371,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S1009***: This soundwall would follow the right-of-way and transition to the top of a retaining wall along the southbound I-405 on-ramp from Westminster Boulevard. Soundwall S1009 would extend an existing soundwall. Traffic noise impacts are predicted at two single-family residences represented by Receiver R4.8 as well as at Cascade Park represented by Receivers R4.10 through R4.12. Short-term noise measurement ST34 was conducted in the park; however, the measurement levels were suspicious and have not been included in the

analysis. With minimum feasible soundwall heights, the six frontage units of the park would be benefited. In addition, a 5 dB noise reduction would be achieved at five non-impacted single-family residences represented by Receiver R4.13. Figures 17 and 18 in Appendix A1 show the minimum height and length of Soundwall S1009 to provide feasible abatement. Table 7-17 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-17. Summary of Reasonableness Determination Data – Alternative 1 – Soundwall S1009**

| Barrier I.D.: S1009 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.11 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 74 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 1 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 7 | 8 | 9 | 11 | 12 |
| Number of Benefited Residences | 2 | 6 | 11 | 11 | 11 |
| New Highway or More than 50% of Residences Predate 1978[b] | Yes | Yes | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | $47,000 | $47,000 | $49,000 | $49,000 | $51,000 |
| Total Reasonable Allowance | $94,000 | $282,000 | $539,000 | $539,000 | $561,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwalls S1016, S1020, and S1024***: Soundwalls S1016 and S1020 would be located at the edge of shoulder along the northbound on-ramp from Westminster Boulevard and Soundwall S1024 would be located within the right-of-way. Soundwall S1020 would be an in-kind replacement soundwall with a new height. The purpose of Soundwall S1024 is to extend the coverage of replacement Soundwall S1020 to compensate for the encroachment of I-405 onto the existing overcrossing embankment that would occur under Alternative 1. The reconfigured embankment would increase the exposure of a portion of Indian Village Park to freeway traffic noise. Traffic noise impacts are predicted to occur at the outdoor use areas of two different schools associated with the Westminster Lutheran Church and Temple Beth David. Traffic noise impacts are also predicted at Indian Village Park in this area. Soundwalls S1016, S1020, and S1024 would combine to provide at least 5 dB of noise reduction for each of the schools and six frontage units of the park. Figure 18 in Appendix A1 shows the minimum heights and lengths of Soundwalls S1016, S1020, and S1024 to provide feasible abatement. Table 7-18 summarizes predicted soundwall performance and associated cost allowance information.

***Soundwalls S1026 and S1028:*** These soundwalls would be located at the right-of-way line along the northbound side of I-405. Soundwall S1026 would be a southern extension of Soundwall S1028 which would replace and heighten a portion of the south end of an existing soundwall at its current location. Soundwall S1026 would also extend the coverage of the adjoining existing soundwall to compensate for the encroachment of I-405 onto the existing overcrossing embankment that would occur under Alternative 1. The reconfigured embankment would

increase the exposure of nearby homes to freeway traffic noise. Traffic noise impacts are predicted within the outdoor frequent use areas of four single family residences in this area; however, feasible noise reduction could only be obtained at one of the residences represented by Receiver R4.66. Together, Soundwalls S1026 and S1028 would provide at least 5 dB of noise reduction for this residence. Figure 18 in Appendix A1 shows the minimum heights and lengths of Soundwalls S1026 and S1028 to provide feasible abatement. Table 7-19 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-18. Summary of Reasonableness Determination Data – Alternative 1 – Soundwalls S1016, S1020, and S1024**

| Barrier I.D.: S1016, S1020, S1024 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.65 | | | | | |
| Design Year Noise Level, dBA $L_{eq}(h)$: 73 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 4 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 0 | 0 | 0 | 4 | 5 |
| Number of Benefited Residences | N/A | N/A | N/A | N/A | 8 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | N/A | N/A | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | N/A | N/A | $47,000 |
| Total Reasonable Allowance | N/A | N/A | N/A | N/A | $376,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwalls S1079 and S1083***: Soundwalls S1079 and S1083 would be located at the right-of-way line along the southbound side of I-405. Soundwall S1079 would replace and heighten a portion of an existing soundwall at its current location and Soundwall S1083 would extend Soundwall S1079 to the north. Soundwall S1083 would replace an existing soundwall that was located within the right-of way; however, due to the widening of I-405 and the topography of the area, an in-kind replacement soundwall within the right-of-way was not analyzed because the most effective location of a soundwall for this area would be at the right-of way line. Traffic noise impacts are predicted within the outdoor frequent use areas of nine single-family residences in this area. Together, Soundwalls S1079 and S1083 would provide at least 5 dB of noise reduction for five of the nine residences. Figure 20 in Appendix A1 shows the minimum heights and lengths of Soundwalls S1079 and S1083 to provide feasible abatement. Table 7-20 summarizes predicted soundwall performance and associated cost allowance information.

### Table 7-19. Summary of Reasonableness Determination Data – Alternative 1 – Soundwalls S1026 and S1028

| Barrier I.D.: S1026,1028 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.66 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 72 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 1 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 0 | 0 | 0 | 4 | 5 |
| Number of Benefited Residences | N/A | N/A | N/A | N/A | 1 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | N/A | N/A | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | N/A | N/A | $45,000 |
| Total Reasonable Allowance | N/A | N/A | N/A | N/A | $45,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

### Table 7-20. Summary of Reasonableness Determination Data – Alternative 1 – Soundwalls S1079 and S1083

| Barrier I.D.: S1079, S1083 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.60 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 73 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 9 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 3 | 4 | 4 | 5 | 7 |
| Number of Benefited Residences | N/A | N/A | N/A | 5 | 5 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | N/A | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | N/A | $49,000 | $51,000 |
| Total Reasonable Allowance | N/A | N/A | N/A | $245,000 | $255,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

## *Areas without Feasible Noise Abatement*

***Receivers R4.2 through R4.7***: Traffic noise impacts would occur at 10 single-family residences as well as Willow Lane Town and Country School along the southbound side of I-405 along Willow Lane and Mahogany Avenue despite the presence of an existing 10 feet 6 inch high soundwall. The soundwall analysis summarized in Table G-4 demonstrates that replacing the

existing soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figure 17 in Appendix A1 shows these receivers.

***Receivers R4.14A through R4.15 and R4.17***: Traffic noise impacts would occur at 11 first row single family residences along the northbound side of I-405 along Sowell Avenue north of Goldenwest Street. These receivers would be protected by Soundwall S182 located at the edge of the shoulder which would be an in-kind replacement of the existing soundwall located at the current edge of shoulder. However, Soundwall S182 would not provide 5 dB or more of noise reduction when raised above the in-kind height of 10-feet. The soundwall analysis is summarized in Table G-4 demonstrates that Soundwall S182 would not provide 5 dB or more of noise reduction at the 11 impacted residences. Figure 16 in Appendix A1 show these receivers.

***Receivers R4.27, R4.29, and R4.31A***: Traffic noise impacts would occur at the patio areas of three multi-family residences along the northbound side of I-405 between Edwards Street and Westminster Boulevard despite the presence of an existing 14 feet 6 inch high soundwall. The soundwall analysis summarized in Table G-4 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figure 17 in Appendix A1 shows these receivers.

***Receivers R4.35 through R4.58***: Traffic noise impacts would occur at the frequent outdoor use areas of 54 first row and four second row single-family residences along the southbound side of I-405 between Springdale Street and Valley View Street despite the presence of an existing 12 feet 6 inch high soundwall. The soundwall analysis summarized in Table G-4 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figures 18 through 20 in Appendix A1 show these receivers.

***Receivers R4.67 through R4.83A***: Traffic noise impacts would occur at 49 single-family residential units and 28 mobile homes along the northbound side of I-405 between Springdale Street and Valley View Street despite the presence of an intervening existing 12 feet 6 inch high soundwall. The soundwall analysis summarized in Table G-4 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figures 18 through 20 in Appendix A1 show these receivers.

#### 7.2.1.5. SEGMENT 5 – VALLEY VIEW STREET TO SEAL BEACH BOULEVARD

##### *Areas with Noise Abatement*

***Soundwall S1162***: Soundwall S1162 would be located at the edge of shoulder along the northbound side of I-405. It would provide abatement for the City of Seal Beach Tennis Court Center, an area that already experiences some noise reduction from a combination of an existing property wall and berm. The noise analysis indicates that a 5 dB noise reduction would only be achieved at one of the two modeled receivers positioned behind this barrier. Figures 22 and 23 in Appendix A1 show the minimum heights and location of Soundwall S1162 to achieve at least 5 dB noise reduction at this tennis facility. Table 7-21 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-21. Summary of Reasonableness Determination Data – Alternative 1 – Soundwall S1162**

| Barrier I.D.: S1162 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R5.40 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 68 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 2 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier[c]** |
| Barrier Noise Reduction, dB | 1 | 2 | 5 | 5 | 4 |
| Number of Benefited Residences | N/A | N/A | 1 | 1 | N/A |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | Yes | Yes | N/A |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | $43,000 | $43,000 | N/A |
| Total Reasonable Allowance | N/A | N/A | $43,000 | $43,000 | N/A |

*Note:* NA-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] An NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

[c] These results are not reliable due to issues with procedures used in TNM to calculate noise levels when two parallel walls intervene between source and receiver.

### *Areas without Feasible Noise Abatement*

***Receivers R5.19, R5.23, R5.28, R5.30, R5.32, R5.33, R5.35, R5.37, and R5.38***: Along the northbound side of I-405 between Primrose Circle and Aster Street, 24 single family residences as well as Shapell and Blue Bell Parks would be exposed to traffic noise impacts under Alternative 1. These impacts would occur in spite of the presence of an existing 18-foot high soundwall between Violet and Aster Streets along northbound I-405 that would not need to be replaced due to encroachment of I-405 under Alternative 1. Figures 21 and 22 in Appendix A1 show these receivers.

***Receiver R5.39***: The noise impact analysis indicates that Soundwall S1162 would not provide 5 or more dB of noise reduction at a portion of the tennis courts represented by Receiver R5.39. Figure 23 in Appendix A1 shows this receiver.

#### 7.2.1.6. SEGMENT 6 –SEAL BEACH BOULEVARD TO I-605

### *Areas with Noise Abatement*

***Soundwall S431***: Soundwall S431 would be an in-kind replacement of the existing 10- to 14-foot high soundwall at the right-of-way line due to the necessity of constructing a retaining wall at the edge of shoulder in this area. At 20 of the residences behind this soundwall, traffic noise impacts are predicted under Alternative 1 even with the in-kind replacement of the existing soundwall and increasing the height would not provide feasible noise reduction. Figures 24 and 25 in Appendix A1 show the location and height of Soundwall S431.

***Soundwall S434***: Soundwall S434 would replace a portion of an existing soundwall along the northbound side of I-405. It would be located at the edge of shoulder. Soundwall S434 has been proposed for the SR-22 West County Connectors Project and currently does not exist; however,

due to the widening of I-405, the proposed soundwall under the SR-22 project will need to be moved to follow the I-405 project's proposed on-ramp from Old Ranch Parkway. At nine of the residences behind this soundwall, traffic noise impacts are predicted under Alternative 1 even with the in-kind replacement of this segment of the existing soundwall and increasing the height would not provide feasible noise reduction. Figure 24 in Appendix A1 shows the location and height of Soundwall S434 along with the portions of the associated existing soundwall that would remain.

***Soundwall S445***: Soundwall S445 would replace a portion of an existing soundwall along the southbound side of the eastbound SR-22 to southbound I-405 connector edge of shoulder. Soundwall S445 has been proposed for the SR-22 West County Connectors Project and currently does not exist; however, due to the widening of I-405, the proposed soundwall under the SR-22 project will need to be moved to follow the I-405 project's proposed alignment. There would be no traffic noise impacts behind this soundwall. Figure 25 in Appendix A1 shows the location and height of Soundwall S445 along with the portions of the associated existing soundwall that would remain.

***Soundwall S1226***: This soundwall would be located at the right-of-way line along the northbound side of I-405 and would extend to connect to an existing soundwall to the east. The purpose of Soundwall S1226 is to extend the coverage of the existing soundwall to compensate for the encroachment of I-405 onto the existing northbound I-405 to westbound SR-22 embankment that would occur under Alternative 1. The existing embankment currently protects this area; however, the reconfigured embankment/retaining wall would expose this area to freeway traffic noise. Traffic noise impacts are predicted within the outdoor frequent use areas of nine single-family residences in this area. Soundwall S1226 would provide at least 5 dB of noise reduction for four single-family residences. Figure 25 in Appendix A1 shows the minimum heights and length of Soundwall S1226 to provide feasible abatement. Table 7-22 summarizes predicted soundwall performance and associated cost allowance information.

***Soundwall S464:*** Soundwall S464 would be an in-kind replacement soundwall of a proposed soundwall under the SR-22 West County Connectors Project that would need to be replaced due to the additional widening of I-405 under the I-405 project. Traffic noise impacts are predicted within the outdoor frequent use areas of two single-family residences in this area but this soundwall would not provide 5 dB or more of traffic noise reduction. Figure 26 in Appendix A1 shows the location and height of Soundwall S464.

**Table 7-22. Summary of Reasonableness Determination Data – Alternative 1 -- Soundwall S1226**

| Barrier I.D.: S1226 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R6.36A | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 71 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 5 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 1 | 3 | 4 | 4 | 5 |
| Number of Benefited Residences | N/A | N/A | N/A | N/A | 4 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | N/A | N/A | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | N/A | N/A | $47,000 |
| Total Reasonable Allowance | N/A | N/A | N/A | N/A | $188,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

### *Areas without Feasible Noise Abatement*

***Receivers R6.2, R6.3, R6.6, and R6.8 through R6.11***: Traffic noise impacts would occur at 20 multi-family residential units of Leisure World retirement community along the southbound side of I-405 between Beverly Manor and Del Monte Drives despite the presence of 10- to 14-foot high Soundwall S431, which is an in-kind replacement soundwall. The soundwall analysis summarized in Table G-6 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figures 24 and 25 in Appendix A1 show these receivers.

***Receiver R6.24***: Traffic noise impacts would occur at three single-family residences along the northbound side of I-405 on Yellowtail Drive between Silverfox Road and Druid Lane. This receiver is protected by an existing 10-foot high soundwall located along Old Ranch Parkway. However, replacing the existing soundwall with a higher soundwall would not provide 5 dB or more of noise reduction. The soundwall analysis is summarized in Table G-6 demonstrates that 5 dB or more of noise reduction would not be achieved at the impacted residences. Figure 16 in Appendix A1 shows this receiver.

***Receivers R6.26 through R6.29***: Traffic noise impacts would occur at nine single-family residences along the northbound side of I-405 on Yellowtail Drive between Silverfox Road and Druid Lane despite the presence of Soundwall S434 which is a 14-foot high in-kind replacement soundwall. The soundwall analysis summarized in Table G-6 demonstrates that replacing the in-kind replacement soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figure 24 in Appendix A1 shows these receivers.

***Receivers R6.31 and R6.34A***: Traffic noise impacts would occur at the frequent outdoor use areas of five single-family residences along the northbound side of I-405 on Yellowtail Drive east of Druid Lane and on Martha Ann Drive at Spur Lane despite the presence of an existing 14

to 14 feet 4 inch high soundwall. This existing soundwall has been proposed for the SR-22 West County Connectors Project and currently does not exist. The soundwall analysis summarized in Table G-6 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figures 24 and 25 in Appendix A1 show these receivers.

***Receivers R6.37 through R6.39, R6.41 through R6.43, R6.45, and R6.46***: Traffic noise impacts would occur at 20 single-family residences along the northbound side of I-405 on Martha Ann Drive between Tigertail and Salmon Drives despite the presence of an intervening existing and an in-kind replacement soundwall. Noise reduction of a soundwall higher than 16 feet was not analyzed as part of this traffic noise impact study. Figures 25 and 26 in Appendix A1 show these receivers.

#### *Areas with Unusual and Extraordinary Abatement*

Receivers where the predicted peak hour noise level is at or above 75 dBA are to be considered severely impacted. Where severe impacts are identified, unusual and extraordinary abatement must be considered. If a soundwall is determined to be unreasonable based on cost, providing the soundwall for frequent outdoor use areas will still be required when a 5 dB reduction in traffic noise levels is acoustically feasible.

***Receivers R3.48 and R3.50:*** Predicted peak hour traffic noise levels are at or above 75 dBA for these receivers and would be considered severely impacted. Receivers R3.48 and R3.50 each represent one single family residence. Soundwall S841 would provide the required 5 dB reduction in traffic noise levels at these residences.

***Receiver R4.33:*** The predicted peak hour traffic noise level is above 75 dBA for this receiver and would be considered severely impacted. Receiver R4.33 represents one frontage unit of the pool area at the Motel 6. Soundwall S1006 would provide the required minimum 5 dB reduction in traffic noise to below the severe impact criteria.

### 7.2.2. Alternative 2

Tables G-7 through G-12 in Appendix G present the results of the barrier analysis. Tables H-7 through H-12 in Appendix H present a summary of soundwall locations and the minimum heights and lengths to achieve at least 5 dB of noise reduction. Appendix H also presents the locations, heights, and lengths of in-kind replacement soundwalls that do not provide feasible abatement. The project limits of the noise analysis for Alternative 2 are from south of Euclid Street to the I-605 interchange. Figures 5 through 26 in Appendix A2 show the proposed alignment of Alternative 2.

#### 7.2.2.1. SEGMENT 1 – SOUTH OF BRISTOL STREET TO EUCLID STREET

#### *Areas with Noise Abatement*

***Soundwall S649***: Soundwall S649 would be an in-kind replacement of the existing 12-foot high soundwall and would be located at the southbound edge of shoulder. This soundwall would need to be replaced due to the widening of I-405 in this area. Soundwall S649 would tie into a solid 3-foot high safety barrier on the structure of the southbound on-ramp from Euclid Street. The solid 3-foot high safety barrier along the on-ramp is considered in the noise impact analysis and it must be kept for noise reduction in addition to the safety related issues. Traffic noise impacts

are predicted within the outdoor frequent use areas of 14 single-family residences in this area but this soundwall would not provide 5 dB or more of traffic noise reduction. Figures 5 and 6 in Appendix A2 show the location and height of in-kind replacement Soundwall S649.

### *Areas without Feasible Noise Abatement*

***Receivers R1.88 through R1.90, R1.92, R1.93, and R1.95***: Traffic noise impacts would occur at 25 single-family residences along the southbound side of I-405 between New Hampshire Drive and Nevada Avenue despite the presence of existing 14- and 16-foot high soundwalls as well as a 12-foot high in-kind replacement soundwall. The soundwall analysis summarized in Table G-7 demonstrates that replacing the existing soundwall with one at a greater height and increasing the height of the in-kind replacement soundwall would not provide 5 dB or more noise reduction at these residences. Figure 5 in Appendix A2 shows these receivers.

#### 7.2.2.2. SEGMENT 2 – EUCLID STREET TO MAGNOLIA STREET

### *Areas with Noise Abatement*

***Soundwalls S699 and S705:*** Soundwalls S699 and S705 would be in-kind replacements of the existing 16- and 12-foot high soundwalls due to the widening of I-405 in this area. These soundwalls would be located at the southbound right-of-way and edge of shoulder. Soundwall S699 will be on a retaining wall. Traffic noise impacts are not predicted under Alternative 2 with replacement of these existing soundwalls. Figures 7 and 8 in Appendix A2 show the location and height of these in-kind replacement Soundwalls S699 and S705.

***Soundwalls S708, S710, and S718***: These soundwalls which act as a system would be located along the northbound I-405 edge of shoulder and right-of-way line. The purpose of Soundwall S708 is to extend the coverage to the south of in-kind replacement Soundwall S710 to compensate for the encroachment of I-405 onto the existing overcrossing embankment that would occur under Alternative 2. The reconfigured embankment would increase the exposure to three single-family residences to freeway traffic noise. Soundwall S718, which is a new soundwall, would extend in-kind replacement Soundwall S710 further to the north and would end where the retaining wall with safety barrier ends along the northbound Brookhurst Street off-ramp. Traffic noise impacts are predicted at 24 single family residences and Los Alamos Park. Together, Soundwalls S708, S710, and S718 would provide at least 5 dB of noise reduction for 24 single-family residences. A 5 dB noise reduction would not be achieved at three single-family residences represented by Receivers R2.14 and R2.17 as well as Los Alamos Park represented by Receiver R2.15. A 5 dB noise reduction would be achieved at three non-impacted single-family residences represented by Receiver R2.28. Figures 7 and 8 in Appendix A2 show the minimum heights and lengths of Soundwalls S708, S710, and S718 to provide feasible abatement. Table 7-23 summarizes predicted soundwall performance and associated cost allowance information.

***Soundwall S733:*** Soundwall S733 would be located at the shoulder of the southbound off-ramp to Brookhurst Street along the southbound side of I-405 and connects to the safety barrier on top of the retaining wall. Due to the elevation differences, the solid 3-foot high safety barrier along the off-ramp is considered in the noise impact analysis and it must be kept for noise reduction in addition to the safety related issues. Traffic noise impacts are predicted within the outdoor frequent use areas of a single-family residence in this area. Soundwall S733 would provide at

least 5 dB of noise reduction for this residence. Figure 8 in Appendix A2 shows the minimum heights and length of Soundwall S733 to provide feasible abatement. Table 7-24 summarizes predicted soundwall performance and associated cost allowance information.

### Table 7-23. Summary of Reasonableness Determination Data – Alternative 2 – Soundwalls S708, S710, and S718

| Barrier I.D.: S708, S710, & S718 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R2.24 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 68 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 1 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 0 | 1 | 4 | 6 | 6 |
| Number of Benefited Residences | N/A | N/A | N/A | 20 | 24 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | N/A | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | N/A | $45,000 | $45,000 |
| Total Reasonable Allowance | N/A | N/A | N/A | $900,000 | $1,080,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

### Table 7-24. Summary of Reasonableness Determination Data – Alternative 2 -- Soundwall S733

| Barrier I.D.: S733 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R2.34 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 68 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 2 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 4 | 5 | 5 | 6 | 7 |
| Number of Benefited Residences | N/A | 1 | 1 | 1 | 1 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | Yes | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | $43,000 | $43,000 | $45,000 | $45,000 |
| Total Reasonable Allowance | N/A | $43,000 | $43,000 | $45,000 | $45,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S745***: This soundwall would be located at the right-of-way line and inside the right-of-way along the southbound side of I-405 and would extend an existing soundwall to the south. Traffic noise impacts in this area are predicted within the outdoor frequent use areas of two single-family residences and two frontage units of an athletic field of Fountain Valley High School. Soundwall S745 would also extend the coverage of the adjoining existing soundwall to compensate for the encroachment of I-405 onto the existing overcrossing embankment that would occur under Alternative 2. The reconfigured embankment would increase the exposure of nearby homes and apartment complex to freeway traffic noise. Soundwall S745 would provide at least 5 dB of noise reduction for the two single-family residences and two frontage units of the athletic field. Figure 9 in Appendix A2 shows the minimum heights and length of Soundwall S745 to provide feasible abatement. Table 7-25 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-25. Summary of Reasonableness Determination Data – Alternative 2 -- Soundwall S745**

| Barrier I.D.: S745 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R2.41 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 72 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 5 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 0 | 0 | 5 | 6 | 8 |
| Number of Benefited Residences | N/A | N/A | 1 | 4 | 4 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | No | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | $37,000 | $49,000 | $49,000 |
| Total Reasonable Allowance | N/A | N/A | $37,000 | $196,000 | $196,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S746***: Soundwall S746 would be located along the right-of-way line on the northbound side of I-405. This soundwall would extend an existing soundwall to the south and would also extend the coverage of the adjoining existing soundwall to compensate for the encroachment of I-405 onto the existing Slater Avenue overcrossing embankment that would occur under Alternative 2. The reconfigured embankment would increase the exposure of nearby homes to freeway traffic noise. Traffic noise impacts are predicted at the preschool playground associated with Huntington Baptist Church represented by Receiver R2.46. Furthermore, the playground is predicted to be exposed to traffic noise levels of 75 dBA; therefore, it is considered to be severely impacted. Soundwall S746 would provide at least 5 dB of noise reduction for the playground of the school. Even if this soundwall is not reasonable based on cost, it must be built because of the severe impact. Figure 9 in Appendix A2 shows the minimum height and length of Soundwall S746 to provide feasible abatement. Table 7-26. summarizes predicted soundwall performance and associated cost allowance information.

***Soundwall S765***: This soundwall would be located along the southbound I-405 right-of-way line. The purpose of Soundwall S765 is to extend the coverage of an existing 16-foot high soundwall and an existing 14-foot high property wall to compensate for the encroachment of I-405 onto the existing Bushard Street overcrossing embankment that would occur under Alternative 2. The reconfigured embankment would increase the exposure to four single-family residences to freeway traffic noise. Traffic noise impacts are predicted within the outdoor frequent use areas of four single-family residences in this area but this soundwall would not provide 5 dB or more of traffic noise reduction. Figure 9 in Appendix A2 shows the location and height of Soundwall S765.

**Table 7-26. Summary of Reasonableness Determination Data – Alternative 2 -- Soundwall S746**

| Barrier I.D.: S746 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R2.46 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 75 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 7 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 6 | 7 | 7 | 7 | 8 |
| Number of Benefited Residences | 1 | 1 | 1 | 2 | 2 |
| New Highway or More than 50% of Residences Predate 1978[b] | Yes | Yes | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | $51,000 | $51,000 | $51,000 | $51,000 | $51,000 |
| Total Reasonable Allowance | $51,000 | $51,000 | $51,000 | $102,000 | $102,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S766***: Soundwall S766 would be located along the northbound I-405 right-of-way line. The purpose of Soundwall S766 is to extend the coverage of an existing 14-foot 6-inch high soundwall to the north to compensate for the encroachment of I-405 onto the existing Bushard Street overcrossing embankment that would occur under Alternative 2. The reconfigured embankment would increase the exposure to six single-family residences to freeway traffic noise. Traffic noise impacts are predicted within the outdoor frequent use areas of six single-family residences in this area but this soundwall would not provide 5 dB or more of traffic noise reduction. Figure 9 in Appendix A2 shows the location and height of Soundwall S766.

***Soundwalls S786, S788, and S792***: These soundwalls which act as a system would be located along the northbound on-ramp from Warner Avenue and northbound off-ramp to Magnolia Street. Soundwall S786 would be a new wall and the purpose of Soundwall S788 is to extend the coverage to the south of Soundwall S792 to compensate for the exposure of freeway traffic noise to five single-family residences due to the opening provided by the structure of the northbound on-ramp from Warner Avenue over the northbound off-ramp to Magnolia Street. Soundwall S792 is an in-kind replacement of existing soundwall. Furthermore, due to the

configuration of these ramps, absorptive materials/panels will be required on the traffic side of Soundwall S792 and on the retaining wall associated with the Warner Avenue on-ramp to prevent the traffic noise from reflecting between the soundwall and retaining wall. Traffic noise impacts are predicted within the outdoor frequent use areas of 13 single-family residences in this area; however, Soundwalls S786, S788, and S792 would only provide at least 5 dB of noise reduction for three impacted single-family residences represented by Receiver R2.81. Figures 10 and 11 in Appendix A2 show the location and height of Soundwalls S786, S788, and S792. Table 7-27 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-27. Summary of Reasonableness Determination Data – Alternative 2 – Soundwalls S786, S788, and S792**

| Barrier I.D.: S786, S788, & S792 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R2.81 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 67 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: -2 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 0 | 0 | 0 | 4 | 5 |
| Number of Benefited Residences | N/A | N/A | N/A | N/A | 3 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | N/A | N/A | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | N/A | N/A | $43,000 |
| Total Reasonable Allowance | N/A | N/A | N/A | N/A | $129,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

### *Areas without Feasible Noise Abatement*

***Receivers R2.14, R2.15, and R2.17***: Traffic noise impacts would occur at three single family residences as well as Los Alamos Park along the northbound side of I-405 just north of Talbert Avenue. These receivers would be protected by Soundwalls S708, S710, and S718; however, the soundwall analysis summarized in Table G-8 demonstrates that increasing the heights of these soundwalls would not provide 5 dB or more of noise reduction at the three impacted residences and the park. Figures 7 and 8 in Appendix A2 show these receivers.

***Receivers R2.35 and R2.37 through R2.39***: Traffic noise impacts would occur at 11 single-family residences along the southbound side of I-405 between Sturgeon Avenue and Fremont Street despite the presence of an existing 12-foot high property wall. The soundwall analysis summarized in Table G-8 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more noise reduction at these residences. Figures 8 and 9 in Appendix A2 show these receivers.

***Receivers R2.47 through R2.49, R2.51 through R2.53, R2.55, and R2.56***: Traffic noise impacts would occur at 23 first row single family residences along the northbound side of I-405 between

Slater Avenue and Bushard Street. These receivers are protected by an existing 14-foot 6-inch high existing soundwall. The soundwall analysis is summarized in Table G-8 demonstrates that a higher replacement soundwall would not provide 5 dB or more of noise reduction at the 23 impacted residences. Figure 9 in Appendix A2 shows these receivers.

***Receivers R2.58 and R2.59***: Traffic noise impacts would occur at four single-family residences along the northbound side of I-405 just south of Bushard Street despite the addition of the new Soundwall S766. The soundwall analysis summarized in Table G-8 demonstrates that the addition of Soundwall S766 would not provide 5 dB or more of noise reduction at these residences. Figure 9 in Appendix A2 shows these receivers.

***Receivers R2.63 through R2.66 and R2.69***: Traffic noise impacts would occur at the frequent outdoor use areas of 10 first row single-family residences along the southbound side of I-405 between Bushard Street and Warner Avenue despite the presence of an existing 14-foot and 16-foot 8-inch high property walls as well as the addition of the new Soundwall S765. Receivers R2.65, R2.66, and R2.69 are located in the new Tremont housing development. The soundwall analysis summarized in Table G-8 demonstrates that replacing the existing property wall with one at a greater height and the addition of Soundwall S765 would not provide 5 dB or more of noise reduction at these residences. Figures 9 through 10 in Appendix A2 show these receivers.

***Receivers R2.82, R2.84, and R2.85***: Traffic noise impacts would occur at 10 single-family residences along the northbound side of I-405 between Warner Avenue and Magnolia Street despite the addition of Soundwalls S786 and S788 as well as in-kind replacement Soundwall S792. The soundwall analysis summarized in Table G-8 demonstrates that increasing the heights of Soundwalls S786, S788, and S792 would not provide 5 dB or more of noise reduction at these residences. Figure 10 Appendix A2 shows these receivers.

#### 7.2.2.3. SEGMENT 3 – MAGNOLIA STREET TO BOLSA AVENUE / GOLDENWEST STREET

##### *Areas with Noise Abatement*

***Soundwalls S807, S811, and S827***: Soundwall S807 would be located at the edge of the shoulder along the southbound I-405 off-ramp at Magnolia Street. It would provide a southward extension of the coverage currently provided by an existing soundwall. The southernmost portion of the existing 10 feet 6 inch soundwall would be replaced by Soundwall S811, which is an in-kind replacement and would follow the right-of-way line. A portion of Soundwall S811 would be higher than the portion of existing soundwall it would replace. Traffic noise impacts are predicted at Pleasant View Park and the outdoor frequent use areas of two residences within this area. Soundwalls S807 and S811 together would provide at least 5 dB of noise reduction at seven frontage units within the park and at both residences. Soundwall S827 would connect with Soundwall S811 and would represent an in-kind replacement for the remainder of the existing soundwall in this area. Figure 11 in Appendix A2 shows the minimum heights and lengths of Soundwalls S807 and S811 to provide feasible abatement at the park and the two residences. Figures 11 and 12 in Appendix A2 show the required height and location of Soundwall S827 serving as an in-kind replacement. Table 7-28 summarizes predicted soundwall performance and associated cost allowance information for Soundwalls S807 and S811.

***Soundwall S834***: Soundwall S834 would be located at the edge of shoulder along the northbound side of the I-405 mainline. Traffic noise impacts are predicted at the outdoor

frequent use areas of 11 single family residences. Soundwall S834 would provide at least 5 dB of noise reduction at six of these residences. Figures 11 and 12 in Appendix A2 show the minimum height and length of Soundwall S834 to provide feasible abatement along with the portion of the associated existing soundwall that would remain. Table 7-29 summarizes predicted soundwall performance and associated cost allowance information.

### Table 7-28. Summary of Reasonableness Determination Data – Alternative 2 – Soundwalls S807 and S811

| Barrier I.D.: S807 & S811 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.23B | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 70 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 7 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 5 | 5 | 7 | 8 | 8 |
| Number of Benefited Residences | 7 | 7 | 7 | 7 | 9 |
| New Highway or More than 50% of Residences Predate 1978[b] | No | No | No | No | No |
| Reasonable Allowance Per Benefited Residence | $37,000 | $37,000 | $39,000 | $39,000 | $39,000 |
| Total Reasonable Allowance | $259,000 | $259,000 | $273,000 | $273,000 | $351,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

### Table 7-29. Summary of Reasonableness Determination Data – Alternative 2 – Soundwall S834

| Barrier I.D.: S834 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.16 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 72 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 2 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | NA | NA | 3 | 4 | 5 |
| Number of Benefited Residences | NA | NA | NA | NA | 6 |
| New Highway or More than 50% of Residences Predate 1978[b] | NA | NA | NA | NA | Yes |
| Reasonable Allowance Per Benefited Residence | NA | NA | NA | NA | $45,000 |
| Total Reasonable Allowance | NA | NA | NA | NA | $270,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S841***: Soundwall S841 would be located at the edge of shoulder along the southbound side of I-405. The purpose of Soundwall S841 is to extend the coverage of the adjoining existing 12 feet 6 inch soundwall to the south and carport / property wall to the north to compensate for the removal of some of the existing embankment at the Newland Street overcrossing. A gap would be created due to the construction of a longer bridge, requiring the embankment to be moved outward. That change in the embankment configuration would increase the exposure of nearby receivers to freeway traffic noise. Traffic noise impacts are predicted within the outdoor frequent use areas of four of the residences and at a basketball court located near the gap. Soundwall S841 would provide at least 5 dB of noise reduction at each of these receivers as well as two non-impacted residences. At two of the impacted residences – represented by Receivers R3.48 and R3.50 -- the predicted peak hour noise level is at or above 75 dBA without a soundwall in place; thus, these residences would be considered severely impacted. Where severe impacts are identified, unusual and extraordinary abatement must be considered. If Soundwall S841 is determined to be unreasonable based on cost, providing the soundwall will still be required for these residences. If building a soundwall is not reasonable due to other factors besides cost, then building acoustical treatment must be provided for these two houses. Figure 12 in Appendix A2 shows the minimum heights and length of Soundwall S841 to provide feasible abatement along with the associated soundwall and carport structure / property wall that would flank it. Table 7-30 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-30. Summary of Reasonableness Determination Data – Alternative 2 – Soundwall S841**

| Barrier I.D.: S841 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.48 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 76 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 9 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 7 | 9 | 10 | 10 | 11 |
| Number of Benefited Residences | 2 | 3 | 4 | 7 | 7 |
| New Highway or More than 50% of Residences Predate 1978[b] | Yes | Yes | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | $53,000 | $55,000 | $55,000 | $55,000 | $55,000 |
| Total Reasonable Allowance | $106,000 | $165,000 | $220,000 | $385,000 | $385,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S857***: Soundwall S857 would be located at the edge of shoulder along the southbound I-405 on-ramp at Edinger Avenue. Without abatement, traffic noise impacts are predicted at outdoor frequent use areas associated with seven ground-floor multifamily residential units. Soundwall S857 would provide at least 5 dB of noise reduction at each of these residential units. Figures 12 and 13 in Appendix A2 show the minimum heights and length of

Soundwall S857 to provide feasible abatement. Table 7-31 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-31. Summary of Reasonableness Determination Data – Alternative 2 – Soundwall S857**

| Barrier I.D.: S857 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.56 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 71 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 4 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 3 | 4 | 5 | 6 | 6 |
| Number of Benefited Residences | NA | NA | 7 | 7 | 7 |
| New Highway or More than 50% of Residences Predate 1978[b] | NA | NA | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | NA | NA | $47,000 | $49,000 | $49,000 |
| Total Reasonable Allowance | NA | NA | $329,000 | $343,000 | $343,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S868***: This soundwall would be located along the right-of-way line on the northbound side of I-405. This soundwall would extend beyond the northernmost portion of an existing 14- to 18-foot high property wall in this area. The outdoor frequent use area of one single-family property represented by Receiver R3.63 would experience traffic noise impacts in the absence of abatement. Soundwall S868 would provide feasible noise abatement at this residence. Figure 13 in Appendix A2 shows the minimum height and length of Soundwall S868 to provide feasible abatement along with the portion of the adjoining property wall. Table 7-32. summarizes predicted soundwall performance and associated cost allowance information.

***Soundwall S896***: Soundwall S896 would be located along the right-of-way line on the northbound side of I-405. This soundwall would extend underneath the McFadden Avenue overcrossing. The purpose of Soundwall S896 is to extend the coverage of the adjoining existing soundwall to compensate for the encroachment of I-405 onto the overcrossing embankment that would occur under Alternative 2. The reconfigured embankment would increase the exposure of nearby mobile homes to freeway traffic noise. Traffic noise impacts are predicted within the outdoor frequent use areas of five mobile homes. Soundwall S896 would not provide 5 or more dB of noise reduction at these residences but it would prevent additional noise exposure from reconfiguration of the bridge embankment. Figure 14 in Appendix A2 shows the height and location of Soundwall S896 along with the existing soundwall that it would connect with.

**Table 7-32. Summary of Reasonableness Determination Data – Alternative 2 – Soundwall S868**

| Barrier I.D.: S868 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.63 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 67 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 2 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 2 | 2 | 3 | 4 | 7 |
| Number of Benefited Residences | NA | NA | NA | NA | 1 |
| New Highway or More than 50% of Residences Predate 1978[b] | NA | NA | NA | NA | No |
| Reasonable Allowance Per Benefited Residence | NA | NA | NA | NA | $35,000 |
| Total Reasonable Allowance | NA | NA | NA | NA | $35,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwalls S900, S908, and S916***: Soundwalls S900, S908, and S916 would be located at the edge of shoulder along the northbound side of I-405. Soundwalls S900 and S908 would represent an in-kind replacement of an existing soundwall. Soundwall S900 would be at the same height as the original soundwall but Soundwall S908 would be higher. Soundwall S916 would be a new soundwall. Traffic noise impacts are predicted at the outdoor frequent use areas of five single family residences behind Soundwall S900. These residences are represented by Receivers R3.81 and R3.81A. Greater heights were considered for Soundwall S900, but these greater heights would not provide 5 or more dB of additional noise reduction at these residences. Soundwalls S908 and S916 together are intended to provide abatement at seven single family residences represented by Receivers R3.85 to R3.86A. Together, they would provide at least 5 dB of noise reduction for each of these seven residences. Figures 14 and 15 in Appendix A2 show the heights and lengths of replacement Soundwall S900 as well as the minimum heights for Soundwalls S908 and S916 to provide feasible abatement. Table 7-33. summarizes predicted soundwall performance and associated cost allowance information.

***Soundwalls S907 and S141***: Soundwall S907 would be located at the edge of shoulder along the southbound side of I-405. Soundwall S141 would be located on top of a retaining wall that would be built under Alternative 2. Soundwall S907 would be a new barrier. Soundwall S141 is an in-kind replacement which would replace two existing soundwalls -- one 8-foot high soundwall at the edge of shoulder and one 12 feet 6 inch high soundwall along the right-of-way line. Relative to its base, a portion of Soundwall S141 would not be as tall as the existing 12 feet 6 inch high soundwall. However, the base of Soundwall S141 would be at a higher elevation than the existing 12 feet 6 inch high soundwall, and the elevation of the top of Soundwall S141 would not be below the top-of-wall elevation of the existing soundwall. Traffic noise impacts are predicted within the outdoor frequent use areas of 20 single family residences in this area. Raising Soundwall S141 above the heights of the existing, replaced soundwalls would not provide 5 or more dB of noise reduction at these residences for its entire length except for a

small portion on the south end. Traffic noise impacts are also predicted at College Park. Together with replacement Soundwall S141, new Soundwall S907 would provide at least 5 dB of noise reduction for the six frontage units associated with this park. Figures 14 and 15 in Appendix A2 show the minimum heights and lengths of Soundwall S907 to provide feasible abatement, as well as the height and location of in-kind replacement Soundwall S141. Table 7-34 summarizes predicted soundwall performance and associated cost allowance information.

### Table 7-33. Summary of Reasonableness Determination Data – Alternative 2 – Soundwalls S908 and S916

| Barrier I.D.: S908 & S916 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.86A | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 67 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 2 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 3 | 5 | 6 | 7 | 7 |
| Number of Benefited Residences | NA | 2 | 5 | 5 | 7 |
| New Highway or More than 50% of Residences Predate 1978[b] | NA | Yes | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | NA | $43,000 | $45,000 | $45,000 | $45,000 |
| Total Reasonable Allowance | NA | $86,000 | $225,000 | $225,000 | $315,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

### Table 7-34. Summary of Reasonableness Determination Data – Alternative 2 – Soundwall S907

| Barrier I.D.: S907 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.88 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 68 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 2 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 5 | 5 | 5 | 6 | 6 |
| Number of Benefited Residences | 1 | 4 | 6 | 6 | 6 |
| New Highway or More than 50% of Residences Predate 1978[b] | Yes | Yes | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | $43,000 | $43,000 | $43,000 | $45,000 | $45,000 |
| Total Reasonable Allowance | $43,000 | $172,000 | $258,000 | $270,000 | $270,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S935***: This soundwall would follow the right-of-way line along the southbound I-405 on-ramp from eastbound Bolsa Avenue. It would connect an existing soundwall to an existing 6-foot high property wall south of Bolsa Avenue. Without abatement, traffic noise impacts are predicted within the outdoor frequent use area of one residence in this area. With minimum feasible soundwall heights, one house would receive 5 or more dB of noise reduction. Figure 15 in Appendix A2 shows the minimum height and length of Soundwall S935 to provide feasible abatement along with the adjacent replacement soundwall and property wall. Table 7-35 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-35. Summary of Reasonableness Determination Data – Alternative 2 – Soundwall S935**

| Barrier I.D.: S935 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R3.99 | | | | | |
| Design Year Noise Level, dBA $L_{eq}(h)$: 66 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 3 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 2 | 3 | 4 | 4 | 5 |
| Number of Benefited Residences | NA | NA | NA | NA | 4 |
| New Highway or More than 50% of Residences Predate 1978[b] | NA | NA | NA | NA | Yes |
| Reasonable Allowance Per Benefited Residence | NA | NA | NA | NA | $45,000 |
| Total Reasonable Allowance | NA | NA | NA | NA | $180,000 |

*Note:* N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

### *Areas without Feasible Noise Abatement*

***Receivers R3.3 through R3.10 and R3.12***: Under Alternative 2, traffic noise impacts would occur at the outdoor frequent use areas associated with nine apartment units and at 18 first row single family residences along the northbound side of I-405 between Magnolia and Lunar Streets. These impacts would occur in spite of the presence of an existing 10 feet 6 inch soundwall. Because the existing soundwall provides substantial insertion loss, increases in height would provide limited additional noise reduction. The soundwall analysis summarized in Table G-9 demonstrates that 5 dB or more of noise reduction would not be achieved at these residences. Figures 11 and 12 in Appendix A2 show these receivers.

***Receivers R3.14, R3.17, and R3.18***: Traffic noise impacts would occur at 11 single family residences along the northbound side of I-405 between Lunar and Newland Streets. A soundwall at the shoulder would provide 5 dB or more of noise reduction at as many as six of these residences. However, the soundwall analysis summarized in Table G-9 demonstrates that the remaining five residences would not be provided with 5 dB or more of noise reduction. Figure 12 in Appendix A2 shows these receivers.

***Receivers R3.26 through R3.28***: Traffic noise impacts would occur at eight single-family residences along the southbound side of I-405 between De Ville Circle and Landau Lane despite the presence of an existing 10 feet 6 inch high soundwall. The soundwall analysis summarized in Table G-9 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figure 11 in Appendix A2 shows these receivers.

***Receiver R3.42***: Traffic noise impacts would occur at two single-family residences along the southbound side of I-405 between Heil Avenue and Newland Street despite the presence of an existing 12 feet 6 inch high soundwall. The soundwall analysis summarized in Table G-9 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figure 12 in Appendix A2 shows this receiver.

***Receivers R3.53, R3.54, R3.55, and R3.55A***: Traffic noise impacts would occur at 18 multi-family residential units of the Huntington Creek Apartments along the southbound side of I-405 between Newland Street and Edinger Avenue despite the presence of an intervening existing 15 feet 6 inch high carport structure / property wall. The edge of shoulder in this area is higher than ground level at the carport structure / property wall. Accordingly, a soundwall was considered at the edge of shoulder. However, the soundwall analysis summarized in Table G-9 demonstrates that supplementing the carport structure / property wall with a new soundwall would not provide 5 dB or more of noise reduction at these residences. Figure 12 in Appendix A2 shows these receivers.

***Receivers R3.70 through R3.75***: Receivers R3.70 through R3.75 represent 37 units of the Driftwood Mobile Home Park along the northbound side of I-405 between Beach Boulevard and McFadden Avenue. Traffic noise impacts would occur at these receivers despite the presence of an intervening existing 10 feet 6 inches to 14-foot high soundwall. The soundwall analysis summarized in Table G-9 demonstrates that replacing the existing soundwall with one at a greater height would not provide 5 dB or more of noise reduction at these residences. Figures 13 and 14 in Appendix A2 show these receivers.

***Receivers R3.76 and R3.77***: Receivers R3.76 and R3.77 represent the northernmost five units of the Driftwood Mobile Home Park that would experience traffic noise impacts. The impacts would occur despite the presence of an intervening existing 14-foot high soundwall. In this area, the embankment at the McFadden Avenue overcrossing would be moved outward under Alternative 2 to accommodate the widening of I-405. Soundwall S896 would compensate for the additional noise exposure that the mobile homes would receive due to the reconfiguration of this embankment. However, further increases in the height of Soundwall S896 and the existing soundwall to the south would not provide 5 dB or more of noise reduction at these residences, as demonstrated in Table G-15. Figure 14 in Appendix A2 shows these receivers.

***Receivers R3.81 and R3.81A***: Traffic noise impacts would occur at five single family residences along the northbound side of I-405 north of McFadden Avenue despite the presence of an in-kind replacement 8-foot high soundwall. The soundwall analysis summarized in Table G-9 demonstrates that the replacement soundwall would not provide 5 dB or more of noise reduction at the five residences. Figure 14 in Appendix A2 shows these receivers.

***Receivers R3.95, R3.96, and R3.98***: Traffic noise impacts would occur at 20 single family residences along the southbound side of I-405 north of the Union Pacific Railroad underpass. These impacts would occur despite the presence of an in-kind replacement 8-foot high soundwall and an existing 12 feet 6 inch soundwall. The soundwall analysis summarized in Table G-9 demonstrates that the in-kind replacement soundwall or a higher soundwall replacing the existing soundwall would not provide 5 dB or more of noise reduction at these 20 residences. Figure 15 in Appendix A2 shows these receivers.

#### 7.2.2.4. SEGMENT 4 – BOLSA AVENUE / GOLDENWEST STREET TO SR-22 / VALLEY VIEW STREET, SR-22 EAST TO SPRINGDALE STREET

### *Areas with Noise Abatement*

***Soundwalls S182, S972, and S978***: These soundwalls which act as a system would be located along the northbound I-405 edge of shoulder. Soundwalls S182 and S972 would be in-kind replacement soundwalls; however, Soundwall S972 would be a higher soundwall than the wall it is replacing. Soundwall S978 would extend Soundwall S972 further to the north. Traffic noise impacts are predicted at 11 single family residences, the track and field area of Westminster High School, and Buckingham Park. Together, Soundwalls S182, S992, and S978 would provide at least 5 dB of noise reduction for three frontage units of the high school and six frontage units of the neighborhood park as well as two non-impacted single-family residences. Figures 16 and 17 in Appendix A2 show the minimum heights and lengths of Soundwalls S972 and S978 to provide feasible abatement along with the adjoining in-kind soundwall replacement, Soundwall S182. Table 7-36 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-36. Summary of Reasonableness Determination Data – Alternative 2 – Soundwalls S972 and S978**

| Barrier I.D.: S972 & S978 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.25A | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 71 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 2 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 5 | 6 | 8 | 8 | 9 |
| Number of Benefited Residences | 4 | 6 | 6 | 6 | 13 |
| New Highway or More than 50% of Residences Predate 1978[b] | No | No | No | No | No |
| Reasonable Allowance Per Benefited Residence | $35,000 | $37,000 | $37,000 | $37,000 | $39,000 |
| Total Reasonable Allowance | $140,000 | $222,000 | $222,000 | $222,000 | $507,000 |

*Note: N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.*

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S995:*** Soundwall S995 would be located at the right-of-way line along the southbound side of I-405. Soundwall S995 would replace an existing soundwall at the same location with a new height. Traffic noise impacts are predicted within the outdoor frequent use

areas of five single-family residences in this area. Soundwall S995 would provide at least 5 dB of noise reduction for two of these residences. Figure 17 in Appendix A2 shows the minimum heights and length of Soundwall S995 to provide feasible abatement. Table 7-37 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-37. Summary of Reasonableness Determination Data – Alternative 2 -- Soundwall S995**

| Barrier I.D.: S995 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.1 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 72 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 3 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 0 | 0 | 2 | 4 | 5 |
| Number of Benefited Residences | N/A | N/A | N/A | N/A | 2 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | N/A | N/A | No |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | N/A | N/A | $37,000 |
| Total Reasonable Allowance | N/A | N/A | N/A | N/A | $74,000 |

*Note: N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.*

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S998***: This soundwall would be located at the right-of-way line along the northbound side of I-405 and would extend an existing soundwall to the north. Traffic noise impacts are predicted within the outdoor frequent use areas of two single-family residences and a multi-family unit in this area. Soundwall S998 would provide at least 5 dB of noise reduction for the two single-family residences. Figure 17 in Appendix A2 shows the minimum heights and length of Soundwall S995 to provide feasible abatement. Table 7-38. summarizes predicted soundwall performance and associated cost allowance information.

***Soundwalls S1005 and S1009***: These soundwalls would follow the right-of-way along the southbound I-405 on-ramp from Westminster Boulevard. Soundwall S1005 would replace and heighten an existing soundwall at its current location and Soundwall S1009 would extend SoundwallS1005 to the north. Traffic noise impacts are predicted at six single-family residences represented by Receivers R4.7 through R4.9 as well as at Cascade Park represented by Receivers R4.10 through R4.12. Short-term noise measurement ST34 was conducted in the park; however, the measurement levels were suspicious and have not been included in the analysis. With minimum feasible soundwall heights, the six frontage units of the park would be benefited. In addition, a 5 dB noise reduction would be achieved at five non-impacted single-family residences represented by Receiver R4.13. Figures 17 and 18 in Appendix A2 show the minimum height and length of Soundwall S1009 to provide feasible abatement. Table 7-39 summarizes predicted soundwall performance and associated cost allowance information.

### Table 7-38. Summary of Reasonableness Determination Data – Alternative 2 -- Soundwall S998

| Barrier I.D.: S998 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.32 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 73 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 2 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 2 | 3 | 4 | 5 | 7 |
| Number of Benefited Residences | N/A | N/A | N/A | 2 | 2 |
| New Highway or More than 50% of Residences Predate 1978[b] | N/A | N/A | N/A | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | N/A | N/A | N/A | $45,000 | $47,000 |
| Total Reasonable Allowance | N/A | N/A | N/A | $90,000 | $94,000 |

*Note: N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.*

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

### Table 7-39. Summary of Reasonableness Determination Data – Alternative 2 – Soundwalls S1005 and S1009

| Barrier I.D.: S1005 & S1009 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.11 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 75 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 2 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 8 | 9 | 10 | 11 | 12 |
| Number of Benefited Residences | 2 | 5 | 11 | 11 | 11 |
| New Highway or More than 50% of Residences Predate 1978[b] | Yes | Yes | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | $49,000 | $51,000 | $51,000 | $51,000 | $53,000 |
| Total Reasonable Allowance | $98,000 | $255,000 | $561,000 | $561,000 | $583,000 |

*Note: N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.*

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwall S1006***: Soundwall S1006 would be located along the right-of-way line on the northbound side of I-405. The outdoor pool area of the Motel 6 represented by Receiver R4.33 as well as the interior rooms facing the freeway represented by Receiver R4.33A would experience traffic noise impacts. Furthermore, the pool area is predicted to be exposed to traffic noise levels of above 75 dBA; therefore, it is considered to be severely impacted. Where severe impacts are identified, unusual and extraordinary abatement must be considered. If Soundwall S1006 is determined to be unreasonable based on cost, providing the soundwall will still be required for this hotel. Soundwall S1006 would provide at least 5 dB of noise reduction for the

pool and interior of the first floor motel rooms facing the freeway and would reduce to noise level of the pool area to be below the severe impact criteria. Figure 17 in Appendix A2 shows the minimum height and length of Soundwall S1006 to provide feasible abatement. Table 7-40 summarizes predicted soundwall performance and associated cost allowance information.

**Table 7-40. Summary of Reasonableness Determination Data – Alternative 2 – Soundwall S1006**

| Barrier I.D.: S1006 | | | | | |
|---|---|---|---|---|---|
| **Predicted Sound Level without Barrier** | | | | | |
| Critical Design Receiver: R4.33 | | | | | |
| Design Year Noise Level, dBA $L_{eq}$(h): 78 | | | | | |
| Design Year Noise Level Minus Existing Noise Level: 5 | | | | | |
| **Design Year with Barrier** | **8-Foot Barrier** | **10-Foot Barrier** | **12-Foot Barrier** | **14-Foot Barrier** | **16-Foot Barrier** |
| Barrier Noise Reduction, dB | 7 | 8 | 10 | 11 | 12 |
| Number of Benefited Residences | 7 | 7 | 7 | 7 | 7 |
| New Highway or More than 50% of Residences Predate 1978[b] | Yes | Yes | Yes | Yes | Yes |
| Reasonable Allowance Per Benefited Residence | $51,000 | $51,000 | $53,000 | $53,000 | $55,000 |
| Total Reasonable Allowance | $357,000 | $357,000 | $371,000 | $371,000 | $385,000 |

*Note: N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.*

[a] A NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[b] This adjustment increases the abatement allowance by $10,000 if the project is new highway construction or if most of the benefited residences (more than 50%) existed before January 1, 1978.

***Soundwalls S1016, S1020, S1022, and S1024:*** Soundwalls S1016 and S1020 would be located at the edge of shoulder along the northbound on-ramp from Westminster Boulevard and Soundwalls S1022 and S1024 would be located within the right-of-way. Soundwall S1020 would be an in-kind replacement soundwall with a new height at a new location and Soundwall S1022 would replace an existing soundwall with a taller wall at the existing location. The purpose of Soundwall S1024 is to extend the coverage of replacement Soundwall S1022 to compensate for the encroachment of I-405 onto the existing embankment of the Springdale Avenue overcrossing that would occur under Alternative 2. The reconfigured embankment would increase the exposure of a portion of Indian Village Park to freeway traffic noise. Traffic noise impacts are predicted to occur at the playgrounds of two different schools associated with the Westminster Lutheran Church and Temple Beth David. Traffic noise impacts are also predicted at Indian Village Park in this area. Soundwalls S1016, S1020, S1022, and S1024 would combine to provide at least 5 dB of noise reduction for each of the schools and six frontage units of the park. Figure 18 in Appendix A2 shows the minimum heights and lengths of Soundwalls S1016, S1020, and S1024 to provide feasible abatement. Table 7-41 summarizes predicted soundwall performance and associated cost allowance information.